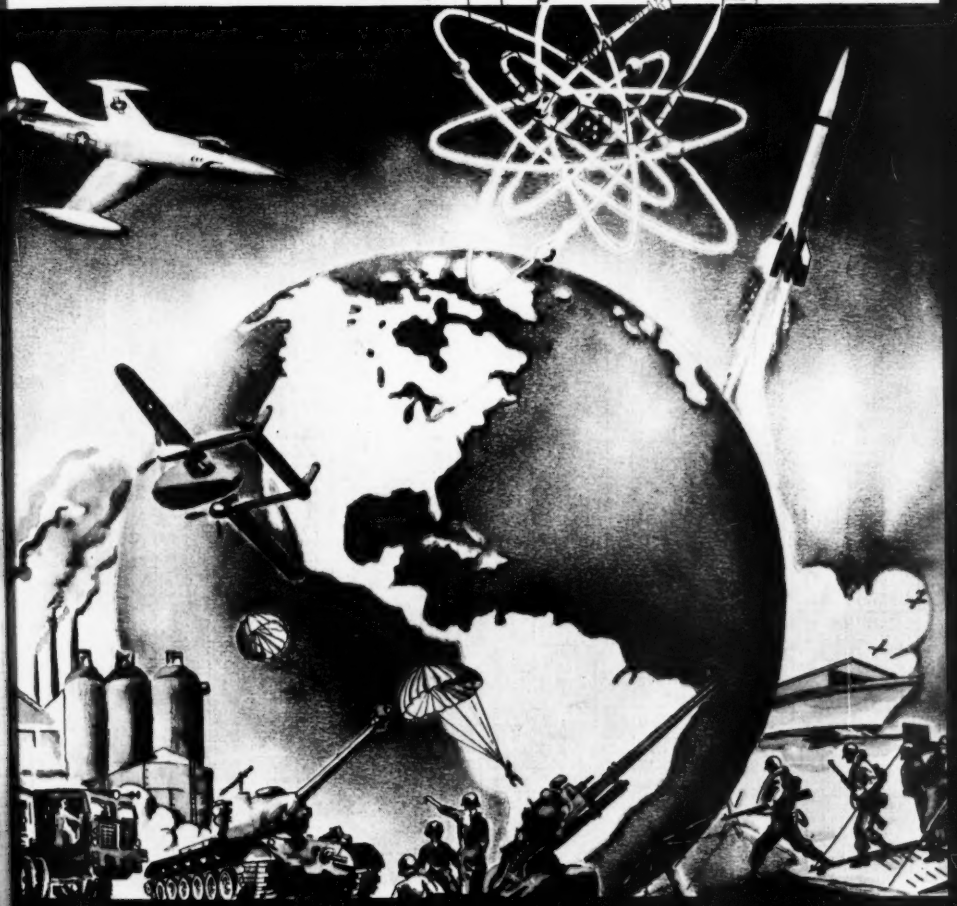
MILITARY REVIEW



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FORT LEAVENWORTH, KANSAS

AUGUST 1955 VOLUME XXXV NUMBER 5

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MILITARY REVIEW

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OVERSUPERVISION

Major Mark M. Boatner, III, *Infantry*
United States Military Academy

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

LIKE ulcers and coronary thrombosis, oversupervision is an affliction that stems from the most admirable of personal traits. Energetic and conscientious people are the most likely victims of all three diseases. The big difference, however, is that ulcers and coronary thrombosis are not contagious; oversupervision is, and can spread from an individual source down through the chain of command to debilitate entire units.

The Germans have rather facetiously classified officers with respect to how each possesses the qualities of intelligence and energy. The brilliant and energetic are alleged to make the best staff officers; the brilliant and lazy make the best commanders (because they look for the easy way to do things); the stupid and lazy can be useful on the vast number of routine duties required of officers. The stupid and energetic, on the other hand, must be promptly identified and ruthlessly eliminated—they are sure poison.

The oversupervisors must be classified as stupid and energetic. That they are energetic goes without saying. Their stupidity, however, is all the more difficult to recognize because of its particularly insidious nature. The officer most prone to oversupervision is, in most instances, an individual who is mentally quick, who has a tremendous capacity for assimilating details (or for simulating this capacity), and whose professional background has made him familiar with the duties of all his subordinates. Why, then, do we call him stupid? Simply because only a stupid man can fail to see that no military organization above squad level can be run for long by one man—no matter how brilliant or energetic. The oversupervisor shows his lack of intelligence by failing to grasp the vital importance of developing an *organization.*

Recognizing the Evil

The final report of the Womble Committee (on Increasing Service Attractiveness) points to oversupervision as one of the factors doing most to drive capable officers and men out of the service and into the arms of private industry. Although this report has been endorsed at the highest levels, it would be stupid to believe that the evil has, therefore, been eliminated. Certainly this top level emphasis will assist materially. The tendency to oversupervise is, however, such

Supervision should be aimed at minimizing the need for supervision in the future. Oversupervision is contagious and can spread from an individual source through an entire command to debilitate complete units

a basic human trait that we must be constantly on guard against it. What can we at the "working level" do about it?

The first and most essential fact is to fully recognize the evil. The commander must be willing to sacrifice some measure of *immediate* efficiency in his organization for long-range efficiency. This, to my mind, sums the matter up very aptly. (I am indebted to the Command and General Staff College for the succinct manner of expressing it.)

We must judge subordinates on more than their day-to-day accomplishment of immediate missions. Let us take a long, analytical look at the commander who handles everything on a "crash" basis. In our admiration for the commander who is inspecting company kitchens before dawn, who hits all training areas during daylight hours, and keeps his staff on duty long into the evening while he personally checks all the paperwork leaving his headquarters, let us not fail to consider whether this commander is developing a *team* that will function when his close personal supervision is no longer possible.

Let us be less hasty to apply the pat verdict of "improper supervision" every time something goes wrong in an outfit.

Above all, just because we are the victims—real or fancied—of oversupervision, let us have the brains and the character not to pass on the disease. This is not so much a matter of consideration for our subordinates as it is a matter of efficiency.

Looking at it selfishly, it is developing subordinates whose initiative and self-reliance will keep us out of trouble on days when we are unable to check their every move.

Korea's Real Lesson

The real lesson of Korea is the evil of oversupervision. I contend that we are in danger of evolving a military system that actually breeds out of the American soldier what natural or acquired initiative he may bring with him into the service. I contend that we actually teach our leaders to oversupervise and require them to do so.

We have talked about the horrors of oversupervision. Now, let us look at some of the basic techniques for eliminating it. There are two specific goals:

1. The development of leadership or command initiative.

2. The development of individual initiative, self-reliance, and attention to duty.

The solution to developing command initiative is to give a subordinate a job and let him do it his own way. I must admit in all modesty that this is not an original thought. I will say also that I have seen few commanders who had the guts to do it. What frightens us so badly about letting a man have a crack at doing the job the Army has trained him to do? Certainly he may make a mistake or two. How else will he ever learn? If he cannot produce without our close supervision, then we are admitting our past failure in training him and are inviting future and more serious failures.

Here, however, is what I consider to be the very heart of the problem: *We must acquire the courage to approve actions of our subordinates who, although not perfect, are good enough.* (By "perfect" I mean the way you or I would have done it.) This is not the philosophy of indolence. It is a matter of "sacrificing some measure of immediate efficiency for long-range efficiency."

Major Mark M. Boatner, III, was graduated from the United States Military Academy in 1943. He organized and commanded the Lido Training Center in Italy after World War II. He served in Korea as S3 of the 23d Infantry Regiment, 2d Infantry Division. He is the author of "Needed: American 'Guards' Outfits," which appeared in the July 1955 issue of the MILITARY REVIEW. *Following his graduation from the 1954-55 Regular Course of the Command and General Staff College, he went to West Point where he is presently assigned to the United States Military Academy.*

"Nobody told me. . . ."

As for individual initiative, think of the Army's increase in over-all efficiency if officers and men were motivated by their own sense of right and duty rather than by directives, programs, and "drives."

With all the fuss we make over area police in the Army, why should a soldier have to be told to pick up a piece of paper he sees lying in the company street?

I have no pat formulas for developing initiative and self-reliance in the individual American soldier. I have seen it very successfully done, however, in units that had a good commander who was left alone long enough to analyze the particular leadership problem and to apply his own particular solution. This calls for leadership of an intelligent, imaginative type.

It calls for supervision whose primary purpose is to minimize the need for supervision in the future.

A military organization should be a machine which, like an automobile, responds to the directions of one driver. The commander, like the driver, must be free to watch the route ahead and must have the leisure for thought. He cannot perform his real job properly if he spends most of his time charging around with an oil can and a monkey wrench to keep the machine running properly.

THE MISSION OF THE MILITARY REVIEW

The MILITARY REVIEW has the mission of disseminating modern military thought and current Army doctrine concerning command and staff procedures of the division and higher echelons and to provide a forum for articles which stimulate military thinking. Authors, civilian and military alike, are encouraged to submit materials which will assist in the fulfillment of this mission.

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Remuneration for all published articles submitted by military writers (active-duty personnel of the uniformed services of the United States Armed Forces) in the magazine is on a competitive basis.

Monthly Award—All articles written by military authors published in each issue are reviewed by a board of officers representing the Command and General Staff College. The board selects the first and second best articles published each month. The authors of the selected articles receive $100 and $50, respectively.

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Reimbursement for published articles submitted to the MILITARY REVIEW by civilian authors (to include retired military personnel, and reserve personnel not on active duty) is on an individual basis.

Survey of the Land Routes Into the Soviet Union

Brigadier General Paul M. Robinett, *United States Army, Retired*

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

BEFORE undertaking a survey of the land routes into any area, it is well to note that ground routes, water routes, and air routes are not separate but interlocking. It is not, however, inappropriate to consider land routes by themselves because water routes extend from port to port—the termini of important land routes—and air routes are best developed in the general areas of important surface routes where there are human needs to satisfy. Geographical, climatic, and weather conditions have had a profound influence upon human activities from remotest time. There is every reason to believe that these overriding influences will continue to have a decisive influence on land and sea routes.

The shape of the earth, with the unity of the atmosphere and the world ocean, is the compelling factor of modern warfare. Very likely all great wars of the future will follow the global pattern of World War II but in a much grander, wide ranging, more rapid, and destructive way. Science is gradually breaking down the barriers to the unity of the world—a unity that has always existed in nature, but not in the hearts of men. The insuperable barrier to the unity of mankind is man himself.

The history of mankind covers only an infinitesimal span of geological time. His recorded history covers a much shorter period of time, but it is characterized by geographical seats of events where the decisive roles in world affairs have been played. These centers have shifted from time to time and probably will continue to shift in conformity with evolutionary trends. In prehistoric and even in early historic times these shifts were extremely slow, but with the development of science there has been a corresponding acceleration which has caused even greater instability among the nations. As Homer Lea has aptly pointed out in his *The Day of the Saxon:*

All national frontiers are subject to constant fluctuation and must be forever shrinking or expanding. They can no more remain delimited than can the coastline of oceans, for they are those indefinable shores where break the restless, turbulent seas of life.

The great, world shattering wars have been fought between opposing seats of power contending for the centrifugal center. Several minor nations were destroyed and others reduced to the status of mere puppets by the Soviet Union following World War II. At the same time, the opposing or *Blue* powers have released their control of numerous territories many of which are not really prepared to play a separate political role. This has contributed to world instability. Other free nations have lost their relative positions in the world because of a lack of resources

or facilities to keep up with the advance in science, mechanization, and tactics. Populations are expanding at an unprecedented rate further complicating problems already complicated.

During World War II, two unnatural coalitions fought for supremacy in a world shattering struggle. It ended with the destruction of the Axis Powers and the creation of two new hostile combinations within the framework of the quarrelsome, strife breeding United Nations. One combination, the *Blue World,* consists of a coalition or alliance connected by the oceans; the other, the *Red World,* consists of a communistic dictatorship on the land mass of Eurasia, as a hard core, covered by satellites or subservient nations from which long, subversive, and propagandistic tentacles extend into neutral nations and the *Blue World* itself.

Mackinder's Theory

This hostile *Red World* which makes up a major part of Mackinder's geopolitical "World Island" and its potentialities for aggression and defense will continue to challenge the minds of Western strategists until the existing impasse is either resolved by diplomacy or by force. Those responsible for resolving or meeting the challenge should not, however, be deceived by Mackinder's unfortunate, fallacious, and dangerous theory of the "World Island" and the "heartland" or the conclusions he has drawn therefrom:

The matter is not as simple as Mackinder makes it out to be although the men in the Kremlin may believe so to the destruction of themselves and the irreparable harm of all mankind.

By the "World Island" Mackinder means the Africo-Eurasian Continent. He loosely defines the "heartland" as including much of central Eurasia but indicates that "East Europe" is the vital part. Quite obviously, his geopolitical concept is too general for practical application by strategists although space—as an overriding factor in strategy—is dimly discernible in it. This is the sphere in which long-range bombardment aviation and the atom bomb have come to play such an important role in the thinking of strategists. They did not exist in Mackinder's time.

As Fortesque—an eminent British historian—has pointed out:

A community with a more or less empty continent at its back can, with good management, prolong existence for an almost indefinite time for the chances are that the invader will be more quickly exhausted than the invaded.

He draws from this a logical conclusion which concerns all statesmen and soldiers:

That is the secret of the power of Russia and of the United States. It is impossible to hurt them seriously, for the further you penetrate the weaker you are. Little countries . . . may be pierced to the heart at the first thrust. Space . . . means time where war is concerned; and time is the most powerful of all allies.

Again it should be noted that long-range aviation and the atom bomb did not enter into Fortesque's calculations.

The unity between the Soviet Union and China is shallow, and one which could be easily severed. Someday, the Chinese may take the old road of the Mongols and push westward instead of taking the sea to the east

Who rules East Europe commands the Heartland,

Who rules the Heartland commands the World Island,

Who rules the World Island commands the World.

In considering the effect of scientific developments, Air Vice Marshal Kingston-McCloughry of Great Britain stressed the defensive value of space. He has said:

In general, it may be stated as a law that the greater the extent and variety of territory which a nation possesses or commands, the less its strength is liable to suffer by changes in warfare, technique, or economy.

Homer Lea, at an earlier time, believed that scientific developments tend to reduce space and inevitably lead to conflict:

The shrinkage of oceanic space has, by bringing continental nations into closer contact, decreased insular significance and increased the universality and intensity of continental struggles and the necessity to secure control of the intervening sealines whose distance diminishes with each inventive decade.

Then with somber realism Lea concluded:

Each day the world grows smaller, each day mankind is being crowded and jostled together. In this universal pressure all is in a state of flux—man and his habitat. Because of this, decadent and minor states must gravitate with increased momentum toward the larger and more powerful nations. . . .Yet, it is not war that is doing this, it is peace: not the conquest of kings, but the hungers of their subjects; not man in his elementary character of marauder, but man in his highest civilization, in his ten thousand new necessities —his speech across the waters, his flight across the seas.

The *Red World* represents landpower of great offensive capabilities on the "World Island" and of vastly greater defensive capabilities. Its offensive capabilities beyond the seas are rather limited. The *Blue World* represents oceanic power whose outer and essential beachheads or bases overseas are threatened by *Red*. The situation of *Blue* is much the same as that of Japan in World War II. Its military capabilities upon the "World Island" depend upon uninterrupted and continuous use of the oceans and this, in turn, depends upon control of the air over essential routes. Accordingly, the United States should avoid, as far as possible, the widespread commitment of ground forces abroad. Both the troops and their equipment and maintenance must come from the total of American resources. The use of these resources on missions which are not as vital to the future of the United States as the control of the oceans and the air above them would be a rank violation of the principle of economy of force. Diplomacy must win allies who, for the most part, should hold the beachheads for decisive overseas reinforcements. The United States operating from a vast central *position in readiness* would then be prepared to act with decisive effect against *Red* aggression.

With the sealanes and the air space above essential routes secure, the United States would be justified in taking military action against decisive enemy objectives once the *Reds* should transgress areas vital to our national security or to the security of the free world. It would risk defeat by deploying enormous land forces abroad without a reasonable prospect of holding control of the oceans just as Japan did when she deployed her Army overseas. Having lost control of the sea

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Brigadier General Paul M. Robinett, Retired, is the author of "Economy of Means," "History and the Military Profession," and "The Exploitation of History by the United States Army," which appeared in the February, May, and December 1954 issues of the MILITARY REVIEW. *A graduate of the Command and General Staff College (1934) and the Army War College (1937), he served in North Africa and Tunisia during World War II. He was Commandant of The Armored School during 1944 and 1945. Since 1948, he has been Chief of the Special Studies Division, Office of Military History.*

in her own area, the Japanese Empire fell apart like a deck of cards. Japanese land forces abroad became utterly helpless.

Center of Power

Assuming that the *Blue World* does not fall into a decisive strategical error and by good fortune has been able to hold important beachheads on the "World Island"—a necessary condition to any satisfactory offensive-defensive posture—the first question which must be decided before initiating plans for an offensive against the aggressor would be the delineation of the geographical center of power of the *Red World* and an evaluation of the various routes leading to this decisive area.

The center of power of any nation includes the heavy industry, the vital centers of population, the essential resources upon which industry feeds, and the transportation facilities necessary to bind the area into a unified whole. The center of power of a nation is of vital concern to statesmen and soldiers alike. Extraordinary measures will be taken to protect such an area and decisive military operations may be expected before it is attained.

Sea, land, and air routes may be used to reach the "heartland" of the Soviet Union.

So far as is known, the center of Soviet power is included in the following area: Moscow — Sverdlovsk — Chakalov — Astrakan—Novorossiysk—Odessa—Kiev. In this vast area are found the center of political power, a great part of the industry, natural resources, food supply, and the technically trained population, and the important railroad and road centers

and the navigable streams. While the loss of this area would not necessarily bring about the collapse of the Soviet regime, its ability to wage modern warfare would be largely gone. The Moscow area, above all, would seem to be the focal point within the larger circle. It is the focal point because it is the political center of the Soviet Union, the hub of the transportation and communication systems, and a highly important industrial and population center. In the geographical discussion which follows, the *Red* center of power—and the Moscow area in particular—should be kept in mind.

The *Red* center of power is located well to the west of the geographic center of the Soviet Union, where it is most exposed to outside interference. The rulers in the Kremlin probably have been more sensitive about this than is generally realized. If nature had favored the location of the center of power north of the Himalayan Mountains in central Asia, the *Red* fortress would be practically unassailable, by non-Asian powers, from the east, north, and south—although there are weaknesses on the northwestern and southwestern flanks.

East to West

The most successful invasion of the region of the *Red* center of power was from the east by the Mongol hordes which swept westward following the easy routes dictated by geography. They conquered all eastern Europe. The routes followed by the Mongols are the same ones used by the Moscovites in their various pushes to the west and east and by the European powers in their drives to the east. Charles XII of Sweden in 1708, Napoleon of France in 1812, William II of Germany, with Allies in World War I, and Hitler's Germany in World War II all traveled the west-east route. For a time, the Turks threatened Moscow from the south from a base on the north shore of the Black Sea.

For all practical purposes the *Blue World* can disregard the land routes into the Soviet Union from eastern and southern Asia as too difficult, distant, and impracticable.

In the west, the great north European plain—stretching unbrokenly into the *Red* center of power and to its focal point, Moscow, and then bending southeastward to the remotest areas of the *Red* center of power—is the all-important geographical feature. It is the key to the Soviet Union as it is to western Europe. It is the route along which history has been made for centuries past. It is a temptation to the mechanized land forces of the Soviet Union but in this atomic age could become the road to ruin for the *Red* colossus. By a much slower process it spelled ruin to the mounted Mongol hordes of long ago.

All attempts to penetrate Russia to decisive areas from the west have come to grief for various reasons among which were space, climate, and weather. None of the invaders were prepared for the unequal contest. Science has developed techniques, equipment, weapons, communications, and engineering facilities capable of shattering nature's protective barriers to the *Red* center of power. This should serve as a deterrent to reasonable men—but the *Red* rulers may prove to be adventurers.

West to East

A ground attack from west to east would necessarily lead to the devastation of European countries which are to be liberated. This would constitute an enormous handicap in the postwar period. After breaking through the satellite countries, the invader would encounter a wide, poorly developed region, which is split into northern and southern sectors by the Pripet Marshes. These marshes have always played a decisive role in the strategy and grand tactics of western invaders. The

undeveloped rivers running generally south to north or north to south constitute serious barriers to armed forces moving from west to east. During the rainy season which follows the breakup of ice, they are especially difficult.

These barriers would delay the attacker and enable the defender to gain time for decisive operations which would take place in the great industrial region farther to the east. The roads are poor and the railroads inadequate and of a different gauge from those of the west. The farther an army advances to the east the wider would become the theater of war, because Europe becomes progressively wider as one moves toward the east. An advance on a broad front would thus require ever-increasing force—greater than any coalition could possibly bring against the Soviet Union in the foreseeable future. In this connection, it is to be noted that even the huge armies of the Axis Powers were unable to cover it adequately in World War II. The indigenous population left in the wake of the advancing armies would be half starved and ready as always to feed and prey upon the invader. The problems of partisan warfare would automatically and instantly arise.

Narrow Front

An advance on a narrow front would involve even greater difficulties. The enemy could not be brought to a decisive stand short of Moscow where an invader on a narrow front would be in the worst possible situation frontally as well as from the direction of Leningrad and the industrialized area to the south and the southeast of Moscow. In this case, the war on a grand scale would not end with the fall of Moscow because the greater part of the war potential of the Soviet Union would still remain intact.

In summary, a decisive success will be hard to achieve from the west as Napoleon —operating on a narrow front—and Hitler—operating on a broad front—so clearly demonstrated. The Central Powers were more successful in World War I by attacking the Soviet regime from within—but even this proved to be a shortsighted approach to the problem.

A ground attack from the south could only be initiated after air supremacy had been secured over the Eastern Mediterranean and the Black Sea and contiguous terrain so as to permit amphibious operations. It would be predicated upon controlling the Mediterranean and holding or regaining possession of Turkey and the Balkans. Such an attack would be directed at the center of power of the Soviet Union from the very beginning. The combined arms—air, sea, and land—could all play an important role in this area. Any advance inland from the Black Sea would almost immediately threaten vital war industries and resources and would bring on decisive fighting. This should facilitate the destruction of the Soviet dictatorship and the elimination of its chief basis of power, the Armed Forces—the primary military objectives of such a war. The rivers run generally from north to south in that part of the Soviet Union and are navigable for considerable distances during the warm season although they are frozen during the winter. The terrain is generally steppe land which is firm in the summer when dry. With every advance toward the focal point of Moscow irreplaceable industries and resources, essential to the Soviet war economy, would be lost. The capture of the Moscow region, together with that south to the Black Sea, would be disastrous to that nation. Although the war might continue for many years, it could not be fought on a grand scale. In the preparatory stage for an advance from the south, air enthusiasts would have an opportunity to demonstrate by a vast double envelopment of the "heartland" whether or not it is possible to bring a nation to terms without resorting

to land operations. At the present time, such an outcome appears to be improbable.

During the course of the operations, *Red* satellites would tend to fall away as Soviet reverses mounted. *Red* occupation of European lands would certainly become a handicap to the Soviets at such a time. Her mechanized forces could even become immobilized and an easy prey to partisans.

The geographical factors favor an attack on the Soviet Union from the south —through the Eastern Mediterranean and Black Sea area, rather than from the west or from any other direction. In this connection, however, it is to be noted that the farther the scene of battle or theater of operations from the homeland the greater will be the proportion of available strength required for line of communications or service and replacement forces. An analogy is the pyramid whose base must be broadened as the height is increased. There is, thus, a physical limit to which any nation can effectively exert force against a determined enemy with ample space for maneuver.

Once strategical objectives have been determined, the principle can be applied in light of the enemy's known capabilities to determine whether or not the required effort is within national and allied means. Whether or not American and allied means and their dispositions, in light of Soviet means and dispositions, favor the southern route can only be determined by those possessing classified information concerning these critical military factors.

Conclusion

In conclusion, it is to be noted that the *Red* Soviet imperialism has helped to create a *Red* Chinese imperialism. Ideologically the two imperialisms are allied by the veneer of communism. This unity is, therefore, shallow and could be shed easily. Someday, the Chinese may take the old road of the Mongols and push westward instead of taking the sea to the eastward.

The aggressive foreign policy of the Soviet Union supported by overwhelming armed forces in eastern Europe, if continued, may eventually lead to war. If this should occur, historic sea, land, and air routes from the north and south may be used in a vast double envelopment of the "heartland." If this should come to pass, the land routes to Moscow from the west and from the southwest will eventually resound to the tread of mechanized troops as they move on the remnants of an unfortunate people led to their doom by callous leaders.

If so, what should be done with the land and the surviving people? This after war objective would then become the all-important consideration. The Western World hopes and prays that reason will prevail. If, in the end, the survival of Western civilization depends upon the use of force, it should be used. That may be the cross mankind must bear to gain relief from perpetual war.

AUTHORS

Authors submitting materials to the MILITARY REVIEW are requested to forward manuscripts through the Security Review Branch, Office of Public Information, Office Secretary of Defense, The Pentagon, Washington 25, D. C.

Probability and Atomic Support

Lieutenant Colonel Malcolm M. Jameson, *Infantry*
Instructor, Command and General Staff College

AN UNDERSTANDING of the role of probability in atomic support planning is essential to the proper utilization of these powerful weapons. The impact of probability considerations on tactical planning and fire support co-ordination should be appreciated fully by the commander and his staff. The scene which follows illustrates how probability provides the flexibility in tactical plans which is so vital when atomic weapons are used in support of ground operations.

Colonel Shield, Chief of Staff, I Corps, had every reason to feel pleased. The fall maneuvers—a full-scale, 2-sided affair—were underway and things were going well for I Corps.

Aggressor, represented by II Corps, had been skillfully maneuvered into a situation where a sizable portion of his force presented a lucrative target for an atomic attack. The Corps Commander—after hearing the staff estimates—had decided to breach Aggressor's defenses, using atomic weapons. Immediately after the atomic attack, the infantry would make the penetration and the armored division would roll through in exploitation. Warning orders had been published in ample time and all the necessary detailed co-ordination had been accomplished. There remained only a final briefing of the Corps Commander, his major subordinates, and the press, followed by the issuance of the formal orders.

"Yes," thought the chief, "everything is pretty well racked up. The staff is working smoothly. G1 hasn't complained about being shorthanded in over a week. G2's estimates are making sense, and G3 —although still an artilleryman at heart —has stopped trying to run the Corps Artillery himself. G4 has even said he can support. . . ."

The chief's reflections were interrupted by the arrival of Colonel Power, Corps G3, Colonel Search, G2, and Major Slipstick, a new addition to the G3 section who had recently completed a course in analysis of atomic targets.

"Sit down, gentlemen," said Colonel Shield. "When we brief the General at 1100, I expect that we'll have several high ranking observers present as well as plenty of reporters. I want this briefing to go smoothly, so I've called you in to check on what you intend to cover. I will open the proceedings with a few general remarks regarding the purpose of the briefing. Then I intend to turn the briefing over to you, Search. What do you plan to cover?"

"Well, Colonel Shield," said the G2, "I intend to give a brief outline of the enemy situation, point out the recent significant developments, and state the enemy capabilities as we have them listed in our latest estimate. As you know, it looks as though Aggressor is off balance and has to regroup now that we've stopped him. While he still has an attack capability, indications point to a defense—at least

An understanding of the probability considerations of atomic weapons upon tactical planning and fire support co-ordination is essential to a proper and profitable utilization of these new and powerful weapons

temporarily. After I get through the highlights of the intelligence estimate, I am going to describe in detail the atomic targets we have picked out. This logically leads into G3's presentation, so I will hand the pointer to Power here."

"All right, Search," said the Chief of Staff, "your approach sounds good to me. Just hit the high spots; the details are all in the intelligence estimate and annex. How about you, Power, what's your plan?"

The G3 and Major Slipstick rose and moved to the situation map. Then Power spoke, "Sir, Slipstick and I are going to put this on together. I will announce the mission and cover the concept of the operation. Major Slipstick will describe the results expected from the atomic attack. Then I will continue with the rest of the operation order including the specific tasks of the subordinate units."

"Our mission has not changed," stated Colonel Power. "Thirtieth Army has ordered I Corps to advance to the east, seize the city of Yorkberg, and secure crossings over the Big Muddy River."

"As we visualize the operation, in brief, our concept," added Power, "is that we shall first breach Aggressor's hasty defense line. Although he now has a numerical superiority, our 2-weapon atomic attack will substantially weaken and disorganize his defense. Exploiting the atomic attack, the 20th Infantry Division—making the main effort—will penetrate Aggressor's hasty defenses, secure the shoulders of the gap, and seize the initial objective, prepared to continue the attack to the east. The 23d Armored Division—initially in Corps reserve—will be prepared to pass through the 20th on Corps order with the mission of seizing Yorkberg and the river crossings north of the city."

Colonel Power paused and looked around the room. "Commitment of the armored division will depend on the success achieved by the atomic attack and the rate of progress of the 20th Infantry Division. Aggressor has not committed his own armor so he has a substantial capability for counterattack. If all goes well, it may not be necessary to commit the 23d Armored Division, since the infantry has enough transportation attached to enable it to seize the Corps objective rapidly *if* they don't get bogged down in making the penetration."

Colonel Shield studied the map carefully. "As I see it, our plan has to be flexible and much depends on the results of the atomic preparation. What do you expect it to achieve, Major?"

Major Slipstick took the pointer and turned to the map. "Sir, the objective of the atomic attack in this case is to weaken and disorganize Aggressor's defenses sufficiently so that the penetration can be made. As you will recall, the General agreed that a reduction of Aggressor's strength in this area (pointing) by one-third would be enough to accomplish that job. For planning purposes, I used 35 percent casualties as a minimum goal. This can be accomplished with two weapons. A 15-kiloton weapon at recommended ground zero (RGZ) 1, and a 20-kiloton weapon over here—both low air bursts delivered by rocket—will satisfy the requirements."

Slipstick glanced at his notes, "Actually we have a 95 percent assurance of getting at least 35 percent casualties in the 68th Aggressor Regiment and in the two battalions of the 90th. We also have

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Lieutenant Colonel Malcolm M. Jameson served with the 27th Infantry Division during World War II. He served as an instructor in amphibious intelligence with the Amphibious Training Command, Pacific Fleet, for 3 years and was assigned to the 25th Infantry Division in Korea from September 1951 to July 1952. He was stationed at Fort MacArthur, California, with III Corps for 1 year. A graduate of the Associate Course of the Command and General Staff College in 1953, he was assigned to the faculty of the College in January 1954, where he is presently serving as an instructor.

an 80 percent probability of causing 50 percent causalties in both target areas and a 50 percent chance of. . . ."

"Hold it, Slipstick," snapped the chief, "I don't care what mathematical machinations you had to go through to arrive at your recommendations. What's all this probability stuff? You know the General wants concise, definite figures to work with."

"I agree, Sir, that simplicity is desirable," interposed Colonel Power, "but in this case, it is not possible to predict exactly what the weapon will do for us. You will recall that Thirtieth Army stated no atomic artillery projectiles would be available for this phase of the operation. This means that if we are to use atomic weapons we must use a delivery means with a sizable delivery error. After considering air delivery and guided missiles, we decided on free rocket because of its ready availability and the ease of coordination and control. The rocket unit is attached to Corps and its delivery error or circular error probable (CEP) is no greater than the CEP of the other possible delivery means. Now, Slipstick's figures indicate the range of the weapon's capabilities expressed in terms of possible damage to the target. For any possible fraction or percentage of the target that might be damaged, there is an associated probability of getting at least that much. This has a definite impact on our tactical plans."

"Don't misunderstand me, Power," said Colonel Shield, "I realize we can't always place the weapon exactly where we want it, and, consequently, the results may vary. But, at a briefing I attended before the maneuver started, it was stated that damage or casualties could also be expressed in terms of what you could expect on the average. I believe the term was 'expected fractional damage,' and this was a single figure without any of this probability business. Can't we use that system in this situation?"

Major Slipstick was quick to regain the floor. "Sir, as a matter of fact, I have figured it both ways. In this case the expected fractional damage—or what you would obtain on the average from a large number of identical trials—is about 60 percent. Unfortunately, this figure doesn't tell us much because it is an average which may include everything from bull's-eyes to near misses. Since we are limited in the number of weapons available, we are more concerned with the one-shot probability of getting at least the minimum damage necessary to ensure success of our maneuver."

Colonel Search had been waiting for an opportunity to speak. "Colonel Shield, at first I was somewhat concerned over this mathematical probability concept of damage estimation, but after comparing it to my own business, I see its value. Let me draw a comparison between the intelligence estimate and damage estimation. In the intelligence estimate, we state the courses of action open to Aggressor which may affect our mission. Although some of these capabilities may seem unlikely or remote, we do not ignore them. When we can justify it—and we usually can—we also describe the relative probability of Aggressor adopting any one of these capabilities. It seems to me that Slipstick's probability figures represent a mathematical means of the same type of consideration of the capabilities of the weapon. On the other hand," continued the G2, "suppose I were to state the enemy capabilities like this." Search paused and pointed dramatically to the map.

"Sir, for 30 years as man and boy, I've studied Aggressor's tactics. I've seen situations similar to this develop time after time. Occasionally, Aggressor will attack and sometimes he'll withdraw, but on the average you can expect him to defend, so plan on Aggressor assuming the defense."

"I hope you don't plan on making any

estimates like that, Search," said Colonel Shield darkly, "we'll soon have a new G2 if you do."

"No, indeed, Colonel," replied the G2, "but it is a good analogy. An average figure doesn't mean a great deal if there is a good possibility of getting something quite different."

"What's the reason for having it then?" demanded the chief.

"I think I can explain," said Major Slipstick. "Mathematically the expected fractional damage system is valid, if you recognize its limitations. It is frequently used for speed and convenience in comparing weapons or selecting an RGZ. However, to assess the influence of the weapon on tactical plans you should also have an appreciation of the full range of the weapon's capabilities and limitations and the probability of getting any tactically significant portion of the target."

"All right," said Colonel Shield. "That makes sense. Now, let's get back to what Power said earlier about the impact on tactical plans. What effect does probability have on our plans in this situation?"

Colonel Power took a sheet of paper from Major Slipstick's hands and placed it on the chief's desk. He said, "Naturally, our estimate of the situation will be revised continuously as the battle develops. When and where we will commit the reserve will depend on our estimate at the time the decision is made. The degree of success achieved by the atomic attack is only one factor which will affect that decision, but it is an inportant factor as these figures show. We have attempted here to visualize the outcome of the battle in terms of these calculations of estimated damage."

Colonel Shield studied the paper before him (see estimate on page 17).

At last the Chief of Staff spoke:

"If these figures are accurate, and I assume they are, they certainly indicate the necessity for flexibility in planning our maneuver. As long as we can't be sure of hitting the bull's-eye, it is well to know how much we are likely to get. As I see it, you have a very high assurance of getting the minimum amount of damage required. If we get more, we'll exploit it."

Colonel Power said, "There's another advantage to this probability business that enters into our plans when we integrate our atomic and nonatomic fires. You will note from the map that the command post of the 68th Aggressor Regiment and one unidentified artillery battalion are on the fringe of the target area. Actually, the probability of damaging either installation is less than 10 percent so we plan to give both of them a good beating with part of the artillery ammunition we would otherwise have had to expend to soften up the forward defenses. Often it is just as important to know a target element will not be damaged as it is to know another will be obliterated. Probability helps us determine this very quickly."

". . . which leads us to the question of troop safety," added Colonel Search. "Doesn't probability enter into that?"

"Yes, indeed," said Major Slipstick, "that is very important. Incidentally, the chance of our troops suffering any casualties from these atomic bursts is less than 1 in 10,000 for the attacks we've planned here."

"That's as it should be." Colonel Shield spoke as he rose and glanced at his watch. "Gentlemen, you've convinced me, but you know how the General hates to have his staff surprise him in public. He's due to meet the Army Commander in 20 minutes, so I'd better warn him about this before he leaves. Wait here in case he wants to talk to any of you. We'll finish discussing the briefing plans as soon as I return."

As the door to the General's office closed after Colonel Shield, the waiting officers could hear him start to say: "General, before you meet the Army Commander and take him to the briefing, there's some-

thing I think you ought to know. . . ."

Scarcely 5 minutes had passed before the Chief of Staff emerged from the Corps Commander's office. He smiled as he settled himself behind his desk.

"As often happens, the General was far ahead of me. He not only 'buys' this probability business, but wants to make sure the entire staff understands the impact this has on our plans for atomic support. In fact, the General pointed out to me another reason why we must rely on a mathematical approach to casualty estimation, for the present at least."

"What is that?" asked Colonel Power.

"If you think about it," answered the chief, "we have had no actual field experience on which we can rely. Only two atomic weapons have ever been burst in anger, and in both cases the targets were cities. Tactical targets may react quite differently. Until we have actual experience with these weapons we must rely on theory and on the results of our test shots. Many correction factors to compensate for battlefield conditions have been incorporated in the tools of the target analyst and as far as we know our methods are mathematically sound."

He turned to Major Slipstick. "Tell me, Major, if we can reduce the delivery error of our delivery systems, and if we ever gain actual experience in using these weapons, can we give this probability stuff back to the mathematicians?"

"Well, yes," said Major Slipstick. The rest of his answer was typical, "that is, in all probability."

ESTIMATION OF DAMAGE

Probability of Obtaining at Least a Given Fraction of Damage (Percentage of Casualties)		Probable Tactical Results
Probability	Damage Fraction	
99%	25%	20th Infantry Division can make penetration and seize objective 1 but will require considerable time for reorganization before continuing attack. Early commitment of 23d Armored Division in exploitation will be necessary.
95%	35%	
80%	50%	20th Infantry Division can seize objective 1 possibly without committing Division Reserve. Minimum time required for reorganization. If enemy reserves are slow to react, commitment of armored division *may* be unnecessary.
50%	65%	
30%	75%	Penetration easily accomplished. Objective 1 can be overrun rapidly and the exploitation pushed without delay. Commitment of armored division in exploitation role is unlikely.
10%	85%	

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Novels of World War II: Fire For Effect

Lieutenant Colonel Anthony L. Wermuth, *General Staff*
Plans Division, Office of the Assistant Chief of Staff,
G3, Department of the Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE faint rumbling of the battles of World War II is steadily dying away—except for the occasional boom of a publisher's campaign. On the other hand, the critics' "counterbattery" has long since been initiated and continues in timely salvos. Since Charles MacDonald's ranging "first round" was fired with commendable accuracy in the spring of 1949,[1] some dozen new war novels have appeared, including both important novels and (not necessarily the same thing) novels by important authors. It is timely, once more, to sum up American war novels to date, to assay them for their content of art and verisimilitude in relation to the war—the real war, which, Walt Whitman assured us, would "never get in the books."

I take some mild exception, by the way, to MacDonald's definition of what would be properly included as a war novel, and any reader is at liberty to take exception to mine. For example, I include two books, *Company Commander*[2] and *Guard of Honor*,[3] which MacDonald excluded from his discussion; but I follow MacDonald's lead in considering as outside the field of war novels such wartime fiction as "Jeb" Stuart's account of a conscientious Protestant, *The Objector*,[4] or George Howe's exciting story of spies parachuted into Germany, *Call It Treason*.[5] One reluctantly excludes, as one must, many books which give the student of military affairs, particularly, better war accounts than some of the novels. One such superior narrative is George McMillan's unit history of the 1st Marine Division, *The Old Breed*.[6]

This period is a particularly interesting point at which to take another look at our war novels. Hemingway, Saroyan, and Marquand have published war novels since the spring of 1949, with variable success. Our vantage point of 1952 is even better. Being later, it is focused for a steady look at the entire stream of World War II novels which now, at last, has begun to expand to include wider views where formerly the over-all trend was fairly consistent. One recent novel in particular, *The Caine Mutiny*,[7] stands squarely across the major trends of most of our war novels of the past decade. Perhaps it represents a turning point.

A turn is overdue. World War II novels as a group are diverse, of course, in theme and treatment, but not as diverse as one might well expect of a decade of literature. There is a consistency about them; in fact, there is an appreciable amount of sameness and monotony. Henry Seidel Canby has remarked that entire sections could be interchanged among many of these novels, and, one might add, interchanged without loss or gain.

Obviously, fiction is the prose métier properly suited to something more than a factual account. It can, and should, recreate an emotional atmosphere above and beyond, although including, the plain details of a credible situation involving people. Those novels which fail to make their relationships credible fail as novels. When

A bibliography and citations, which are not normally used, have been included for the convenience of the reader.—The Editor.

figures in novels become symbols, when they are less than people, their justification as characters is questionable; for, as Bernard DeVoto insists, a novel's main concern should be with people.

No one questions an author's prerogative to choose theme, place, situation, or character; but I for one would put bounds on that prerogative. Great novels, Daiches says, must reflect the civilization of which they are a product. Accordingly, when a novelist fails to reproduce his chosen area of that civilization, he is susceptible to criticism beyond that directed at his fictional prowess alone. Provided the reader does not limit his exclusive tests of validity to his own inevitably limited experience, he properly rejects a novel which violates experience, knowledge, or instinct. A serious reader can readily accept and understand persons, events, and interpretations beyond his own experience, provided they are at least made to appear credible or possible. However, if even a simple situation does not ring true, even if only to his instincts, he will not accept it. Because they have violated, or misread, the nature and meaning of our civilization, many World War II novels are failures. The successes stand out like giants, purely by comparison.

George McMillan makes a significant comment when he points out the political exercise which many World War II novels represent.[8] Various degrees of socialism are recommended (or capitalism apologized for) in *The Naked and the Dead*,[9] *An Act of Love*,[10] *The Young Lions*,[11] and others. McMillan sees most of the political theses polarized as antifascism, which has evolved in one violently particular aspect we shall examine later.

The narrowness of their political tub-thumping is paralleled in the narrowness of other aspects of many of these novels; perhaps, in the last analysis, the other aspects are political, too. And how narrow some of them seem as we look back at them. The anti-Semitic theme, for instance, is belabored in great or lesser degree in *The Young Lions*, *The Naked and the Dead*, *The Wine of Astonishment*,[12] *The Crusaders*,[13] *An Act of Love*, *Face of a Hero*,[14] *The Gallery*[15] . . . until, at last, in *The Caine Mutiny*, the Jewish lawyer reverses this theme by denying having endured a lifetime of discrimination.

Narrowness of political theme, particularly, has often led to lack of concern with the background of the war, except as the war may advance the author's political philosophy. The actual physical enemy is often ignored. Some attempts at breadth are made in novels such as *An Act of Love*, *The Naked and the Dead*, or *The Gallery*, but the results are unimpressive. A very few novels, such as *The Crusaders*, almost succeed. Others entirely and violently reject a broader view, until the extreme is reached in *The Adventures of Wesley Jackson*,[16] which makes it clear that Saroyan's major target during the war was not the forces against which the United States Army fought; his enemy was the army in which his protagonist found himself—the United States Army. Outside the central German character in *The Young Lions*, and the Japanese captain who appears briefly in *An Act of Love*, practically no attempt has been made in our World War II novels to delineate the enemy side of the war; and practically no American novel gives any appreciable development to our Allies—always

When we consider our World War II novels in totality, it is difficult to state that we have contributed greatly to American literature. It may well be that the best war novels of this war are yet to be written

excepting the Italians, who managed to be both enemy and friend.

The narrowness of their books is partly attributable to the youth of many of these war novelists, many of whom were completely unknown until the publication of their war novel. Inevitably, we have one result: many works written by young men of limited experience (and limited powers, in many cases) who have apparently taken their limited views as valid for the purposes of fiction. A German, in a very recent magazine article, refers to the same phenomenon in the war literature of his own country, employing the term, "the literature of the sergeants." [17] Every writer is entitled to his own view. But so also is every reader, including title to reject those books whose value he discounts, those which can recount detail realistically (journalistically) but which can make little useful evaluation or interpretation of the effects they observe.

Narrowness of view is one thing; narrowness of scope is another. When Herman Wouk limits his stage to one minesweeper, he thoroughly utilizes the authentic knowledge he possesses based on 4 years of service on a minesweeper during the war. Nevertheless, in his case, Wouk is able to fit his small craft understandingly into larger forces and scope. However, the limited experience and youthfulness of many novelists is reflected in his obvious lack of understanding of the strategy, tactics, or organization of military units.

When Mailer limited himself to the actions of an intelligence and reconnaissance platoon of an infantry regiment, he was reasonably convincing. However, he simply did not have enough military knowledge to fit the platoon into any larger organization or events. When, for instance, one squad of his intelligence and reconnaissance platoon was sent up to the front lines at night to assist a company on the line, and when that company placed the new squad—strange to the company, strange to the ground, at night—on the key flank, one realized that, in the military sense, Mailer simply did not know what he was talking about. It is unnecessary to admit the possibility that circumstances might have justified such an action; Mailer gave no justification.

Nor is it sufficient justification for some of these novelists to imply that they "were there" (not all of them were, by any means). They may have been there and seen much, but what matters in a novel is the ability of the author not only to have seen, but to have understood. Remember how well Stephen Crane understood; yet, at the time he wrote *The Red Badge of Courage* he had not been "there." The ability to see and interpret often seems to be better exercised by those who were not there than by those who were. Contrast two Air Corps novels, for instance: the thoroughly authentic military background of *Guard of Honor*, by Cozzens, who was not there, and the inept military background of *Face of a Hero*, by Falstein, who was. Contrast the Mauldin view with the Pyle view, both men having been there. Contrast the excellent military background of Van Praag's *Day Without End*, [18] or of MacDonald's *Company Commander*, with that of *The Naked and the Dead* or *The Adventures of Wesley Jackson*. To be sure, *The Naked and the Dead* is a better all-around *novel*, but the sometimes questionable authenticity of its military background does not help to make it so.

Lieutenant Colonel Anthony L. Wermuth was graduated from the United States Military Academy in 1940. During World War II, he served in the Aleutians. He is the author of "Mass Man and the Military Officer," which appeared in the March 1955 issue of the MILITARY REVIEW. *He served as an instructor and assistant professor of English at West Point for a 4-year period, and holds a Master of Arts degree from Columbia University. He is presently assigned to the Plans Division, Office of the Assistant Chief of Staff, Department of the Army.*

When *From Here to Eternity*[19] expresses Jones' insight into the soul and world of Pruitt, an enlisted man in Hawaii immediately prior to the war, it rings poignantly, although sometimes exaggeratedly, true. When the novel touches on even the officers of Pruitt's own unit, and their world, it rings false.

This may be the place to note, by the way, the competent military background of the few war novels to be published in this country by foreigners; two excellent new (1950) ones are *Brave Company*, by the New Zealander Guthrie Wilson, and *The Wine of Etna*, by Alexander Baron, a Briton who produced another excellent war novel, *From the City, From the Plough*.

Pettiness

Disturbing is the pettiness of many of our war novels, carried to extreme length in what *Time* has called "the personal gripe school." Novels such as *The Naked and the Dead*, *From Here to Eternity*, *Face of a Hero*, and *The Adventures of Wesley Jackson*, to mention only the most prominent ones, read as though the authors had recorded every frustration they had experienced during their service and, when writing their novels, had emptied their fat notebooks of grievances to be sure to incorporate them all. One can ignore this pettiness in *Face of a Hero* or *The Adventures of Wesley Jackson* (as one could enjoy Mauldin's cartoons and reject the griping prose of a man who was exasperated at the inadequacies of other people) for those are poor novels best ignored in entirety. However, when novels of so many excellences as *The Naked and the Dead* and *From Here to Eternity* include such vitiating elements, one cannot ignore them.

Certainly no student of American literature can ignore Hemingway, either; and, yet, for some reason unaccountable in this author of such first-rate war novels as *A Farewell to Arms* and *For Whom the Bell Tolls*, his latest novel, *Across the River and Into the Trees*,[20] is full of just such petty gripes.

Certainly most readers, particularly those interested in military affairs, understand griping about "brass" as understandable and natural and partly true. However, for novelists to take pettiness seriously and build exclusive motivation upon it in such a way as to find only credence and truth therein, and only falsehood everywhere else, then balance, objectivity, real understanding—and, in fact, truth—go by the board.

Which brings us to the virulent aspect brought about by the anti-Fascist emphasis mentioned earlier. McMillan and others have pointed out the tendency of many American World War II novelists to make of the officer the symbol of the enemy. In a real sense in such political treatises, the officer is depicted as the Fascist against which the proletariat enlisted man found himself arrayed, practically always at the enlisted man's physical, financial, legal, or military disadvantage, and practically always with the enlisted man in the superior moral position. The higher the officer, the more Fascist he has been presented, until one realizes what a stereotype the general often is in American World War II novels—the vain, ruthless, self-glorifying, ambitious, and Fascist general. One has only to recall General Cummings in *The Naked and the Dead*; Iron Orwell in *Mask of Glory*;[21] General Mallon in *A Bell for Adano*;[22] and the generals in *The Crusaders* and *The Strange Land*,[23] not to mention the dictatorial lesser commanders in *World Without Heroes*,[24] *The Gallery*, *The Adventures of Wesley Jackson*, *Mr. Roberts*,[25] and *The Caine Mutiny*. In *Across the River and Into the Trees*, the ex-general boasts of having broken dozens of subordinate officers during the war. How monotonous these people are, how one-sided, and, as a group—to many readers with or without service—how

unacceptable! If it were not for the pervasiveness, and perversity, of this stereotype, one might be inclined to smile understandingly, recalling the grim remark attributed to Admiral King as he moved into the position of Chief of Naval Operations at the beginning of the war: "When things get tough, they always send for the sons of bitches."

Objectivity

It is only in contemplating the objectivity of Cozzens' portrait of General Beal in *Guard of Honor*, and the recent sympathetic portrait by Marquand in *Melville Goodwin, USA*,[20] that one realizes that not all our war novels have had the same obsession with presenting the officer as the Fascist. However, it is particularly in *The Caine Mutiny* that one hears the first real note of positive renunciation of the stereotype. For despite the repellent tyranny of Captain Queeg, the maturing of young Ensign Keith leads him to conclude at the end that the "mutiny" against Queeg was unjustified, and that, in addition, there is increasing evidence that the Navy has, all along, known what it was doing. When Greenwald both denies that he had been discriminated against, and defends the Regular Navy, one realizes with a shock, perhaps, how pervasive the other extreme had become in novels of World War II. Mr. Wouk affords us further relief by eschewing the comprehensive obscenity of many of his predecessors.

In addition to limited knowledge, weak insights, and pettiness, which can be ascribed to immaturity, fascination with problems of high command may seem to some to be another indication of one-sidedness in our novelists. It is interesting to remark the number of novels which concern themselves centrally—aside from the Fascist fixation—with the problems of generals and command, notably *Twelve O'Clock High, Command Decision, Guard of Honor, The Naked and the Dead, Melville Goodwin, USA*, and *Across the River and Into the Trees*. It is interesting, and unaccountable, to realize that the first three are novels concerning the Army Air Corps —generally speaking, one must go to novels of the sea or land, particularly land, for stories of lower grades.

One of the most valuable contrasts is that between the work of the lesser known novelists and that of four established novelists: Ernest Hemingway, William Saroyan, James Gould Cozzens, and John P. Marquand (Irwin Shaw is an established writer of fiction, but his forte has been the short story, not the novel). In this reviewer's opinion, Cozzens comes off considerably the best, Marquand almost so, and Saroyan considerably the worst. That leaves Hemingway next to last, a position painfully ascribed to a novelist who is otherwise a deservedly eminent figure in American fiction. Compared to these major figures, the "newcomers" do not fare badly at all. Mailer's novel, despite its depressing and, at times, repellent philosophy, has stature, both as modern literature and as war literature. Herman Wouk, John Horne Burns, John Hersey, William Wister Haines, Van Van Praag, James Michener, James Jones, and others, either produced good war novels or gave promise that they may one day be capable of producing one. It is worth noting that Hersey, Michener, and Cozzens received the Pulitzer Prize for their war novels.

In summing up those novels published since MacDonald's review in 1949, and in order to complete the record, let us consider briefly those published between that time and 1952, plus the two earlier ones not discussed by MacDonald. In the earlier article, James Gould Cozzens' *Guard of Honor* was omitted reluctantly as not being properly classified as a war novel. I must disagree, for a wider, yet still valid, definition will include it; indeed, the novel is so excellent that one may feel that the definition should be expanded to whatever

breadth is necessary in order to include it. Laid at an Air Corps training base in Florida, the novel's action takes place in 3 days, with a depth of insight, understanding, and variety such as to render it truly remarkable among World War II novels. The student of military affairs will particularly appreciate the sound situation and detail presented by Mr. Cozzens.

The other novel omitted by Mr. MacDonald, *Company Commander*, was possibly omitted because it is not exactly a novel. More likely is it that Mr. MacDonald modestly omitted it because it is his own. Written in novel form, it recounts the author's experiences as a company commander in the 2d Infantry Division in Europe. Admittedly, MacDonald is not a skilled novelist; nevertheless, his book is an authentic narrative of small-unit action and, hence, of interest to those concerned with military matters.

Hardly less satisfactory as a narrative of small-unit action, and written in a tightly controlled, underplayed prose, is Van Van Praag's *Day Without End*, also laid in Europe, and recounting in entirely credible fashion the inevitable hysteria of a competent, conscientious platoon leader who is subjected to too much.

Still another novel laid in Europe, mostly among infantrymen, is Ned Calmer's *The Strange Land*. However, Mr. Calmer's story is told by 12 different characters who are too disparate to contribute to an integrated novel, although, paradoxically, they all sound very much alike. Only privates and company officers are admirable to Mr. Calmer; generals, correspondents, and WACs use the war for private joyrides to power, satisfaction, or glory.

World Without Heroes—written by a wounded veteran while still in Halloran Hospital—is a conventional tale of an infantry company in action in Europe, with little to distinguish it, offering no evaluation or hope concerning the forces of which it treats. Considerably more deft is Dan Levin's *Mask of Glory*, a tale of Marines in the Pacific, whose central character is developed with an understanding touch and in a prose which approaches a poetic level often enough to lift this novel out of the ordinary.

William Saroyan's *The Adventures of Wesley Jackson* is a disappointment to the student of literature and hopelessly inadequate for the student of military affairs. Peopled with Saroyan's strange and somewhat fey characters, it appears to be a diatribe not so much against war as against the Army in which Wesley Jackson is forced to serve during a war, as he "progresses" from training camp to England to the continent. Saroyan's army, indeed, his war, is like none which existed.

Martin Quigley's *A Tent on Corsica*[27] is a collection of short stories of Air Corps life on the island of the title. The stories are varied, yet fit readily into the pattern of World War II novels. Another "island" novel, *The Teahouse of the August Moon*,[28] by Vern Sneider, is an unusual attempt to relate the effect upon both Americans and Okinawans of the American occupation.

Another Air Corps novel, placed in Italy, *Face of a Hero*, by Louis Falstein, is on a level somewhere in the vicinity of *The Adventures of Wesley Jackson*. It is so completely surfeited with gripes, bitter exploited enlisted men, and incompetent, criminal leadership, and it is so utterly lacking in balance, motivation, and digestible characterization that it could be defended only on the grounds that everyone is entitled to have his say, regardless of what he has to say.

Ernest Hemingway's *Across the River and Into the Trees* is, as previously remarked, simply a disappointment. An ex-brigadier general serving in Trieste—an embittered colonel prematurely "old" at 50—expounds his acid philosophy of military things to a young Italian countess with whom he is conducting a love affair. Despite flashes of Hemingway's familiar

vitality and subtlety in both outdoor scenes and relationships between people, the novel is so overloaded with juvenile judgments, pseudomanliness, and lifeless dialogue, that one hopes it will soon achieve the oblivion it merits.

A remarkable novel, James Jones' *From Here to Eternity* is a rough chunk of a story by an ex-soldier—more promising than arrived—who makes it a point to include in his autobiographical data on the book jacket the fact that he was "busted" twice. Perhaps not so much that Jones was busted, but that he insists on telling the reader about it, has some significance. At any rate, his novel concerns one central figure of credibility and creation, Pruitt, a private at Schofield Barracks in Hawaii until just after Pearl Harbor is bombed. There are other characters, too, but none of them is entirely credible. Lacking much military knowledge except that which directly and subjectively concerns Pruitt, intent on recording every unsavory incident and influence and word, ignoring all but a few of the savory ones which must have occurred concurrently—and also shaped his characters—Jones has still produced a novel which is an experience to read. It is really a novel of the Army more than a novel of the war, and, as such, it has considerable value, without being yet a classic. Jones has some distance to go to produce a service novel comparable in quality to what is probably the best all-around novel of an American service ever written, Marcus Goodrich's *Delilah*.[29]

John P. Marquand's *Melville Goodwin, USA* is also, perhaps, more a novel of the Army than a war novel, although it differs from *From Here to Eternity* in contemplating not a private but a general. Marquand has been criticized in some quarters for merely putting his familiar frustrated American upper class male into uniform, which is not an altogether fair charge. While his understanding of the motivations, and even the speech, of American generals leaves something to be desired, his portrait is reasonably informed and on the whole sympathetic—which is a welcome change, if nothing more. However, it is more. It can profitably be contrasted to C. S. Forester's British novel, *The General*, written in the 1930s, to see how much Marquand's view of a professional military figure differs from a British view of the same subject in the 1930s, as well as from the stereotyped general of other American novels in World War II.

Finally, Herman Wouk's *The Caine Mutiny* represents a radical reversal of stereotypes. Told without subtleties or penetrating analysis, the novel is still a satisfying tale for the student of military affairs, not because law and order "triumph" —there is plenty of room for disagreement on the solution—but because the main elements of its problem are *all* brought into some kind of believable focus and developed with vitality and balance.

Conclusion

Considering our novels of World War II in totality, it is difficult to hold that they have contributed much to American literature. War novels in this country have shifted emphasis since the days of James Fenimore Cooper and the Civil War novelists, when the Walter Scott emphasis on war's pageantry and glory predominated, to the post World War I era of E. E. Cummings and John Dos Passos, when the emphasis was exclusively on man's hopelessness and degradation in war. World War II novels, as an entirety, have shifted their emphasis but slightly from the Dos Passos position, although they have shifted away from his extreme.

Perhaps the reason for the current comparative poverty in fiction is simply that we lack novelists of the stature of Austen, Hugo, Tolstoi, Stendhal, or even Thomas Wolfe. Or, perhaps it is that the novel is declining in importance as a literary form. Whatever the fundamental causes

may be, the foregoing discussion is modestly intended to show some of the results.

That fiction is used as a vehicle through which to deliver narrow political or social theses does not necessarily vitiate the value of fiction, although it inevitably tends to do so. However, some of our World War II novels are merely poorly disguised political tracts or wearisome gossip-level disparagement of command. When we eliminate such unseasoned works from serious consideration, there is comparatively little left, quantitatively speaking. The quality of the remainder, regardless of what has been said heretofore perhaps to overemphasize negative features, is high enough to allow a few World War II novels a place in modern American literature.

It may be that the best war novels of World War II are yet to be written.

BIBLIOGRAPHY OF WORLD WAR II NOVELS 1949-52

1. Charles B. MacDonald, "Novels of World War II: The First Round," *Military Affairs*, Spring 1949.

2. Charles B. MacDonald, *Company Commander*, Washington, Infantry Journal Press, 1947.

3. James Gould Cozzens, *Guard of Honor*, New York, Harcourt, Brace and Company, 1948.

4. "Jeb" Stuart, *The Objector*, New York, Doubleday, 1950.

5. George Howe, *Call It Treason*, New York, Viking Press, 1949.

6. George McMillan, *The Old Breed*, Washington, Infantry Journal Press, 1949.

7. Herman Wouk, *The Caine Mutiny*, New York, Doubleday, 1951.

8. George McMillan, "A Decade of War Novels," *The New York Times Book Review*, 9 December 1951, p. 6.

9. Norman Mailer, *The Naked and the Dead*, New York, Rinehart and Company, 1948.

10. Ira Wolfert, *An Act of Love*, New York, Simon and Schuster, 1948.

11. Irwin Shaw, *The Young Lions*, New York, Random House, 1948.

12. Martha Gellhorn, *The Wine of Astonishment*, New York, Charles Scribner's Sons, 1948.

13. Stefan Heym, *The Crusaders*, Boston, Little, Brown & Co., 1948.

14. Louis Falstein, *Face of a Hero*, New York, Harcourt, Brace and Company, 1950.

15. John Horne Burns, *The Gallery*, New York, Harper and Brothers, 1946.

16. William Saroyan, *The Adventures of Wesley Jackson*, New York, Harcourt, Brace and Company, 1949.

17. Hans Schwab-Felisch, "Die Literatur der Obergefreiten," *Der Monat*, March 1952, pp. 644-651.

18. Van Van Praag, *Day Without End*, New York, William Sloane Associates, 1949.

19. James Jones, *From Here to Eternity*, New York, Charles Scribner's Sons, 1951.

20. Ernest Hemingway, *Across the River and Into the Trees*, New York, Charles Scribner's Sons, 1950.

21. Dan Levin, *Mask of Glory*, New York, Whittlesey House, 1948.

22. John Hersey, *A Bell for Adano*, New York, Alfred A. Knopf, 1944.

23. Ned Calmer, *The Strange Land*, New York, Charles Schribner's Sons, 1950.

24. Arthur C. Fields, *World Without Heroes*, New York, Whittlesey House, 1949.

25. Thomas Heggen, *Mr. Roberts*, Boston, Houghton Mifflin Company, 1946.

26. John P. Marquand, *Melville Goodwin, USA*, Boston, Little, Brown & Co., 1951.

27. Martin Quigley, *A Tent on Corsica*, Philadelphia, Lippincott, 1949.

28. Vern Sneider, *The Teahouse of the August Moon*, New York, Putnam, 1951.

29. Marcus Goodrich, *Delilah*, New York, Farrar and Rinehart, 1941.

THE ROLE OF COMMAND IN A TECHNICAL SERVICE

Major Edwin B. Owen, *General Staff*
Operations Division, Office of the Assistant Chief of Staff,
G3, Department of the Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

RECENTLY, while having lunch with a fellow officer, I was astounded by a statement that he made during our conversation. He said, in effect:

Why should an officer of the technical services concern himself with acquiring a background of military knowledge? We are but the civilian part of the Army and, thus, have no responsibility for command. We should leave military affairs and command functions to the combat arms.

It would be disastrous to the mission of the technical services—and would negate successful accomplishment of its mission—to assume that we should only be responsible for the technical aspects of military operations, and that all command responsibility should be left to the other services. The reasons are obvious. If we fail to prepare ourselves, as professional officers, for the function and exercise of command by the acquisition of a military background, then we shall find ourselves unprepared to carry out the missions which would logically fall within our scope of responsibility during military operations. During the intervals of peace, since war appears to be a recurring phenomenon, we are preparing ourselves for the time when an all-out military effort will be required. To fulfill our mission, we must maintain an organization capable of a well-planned and concerted effort. We, ourselves, are responsible for the creation, development, maintenance, and exploitation of this organization.

Permit me to cite the case of my own branch, the Transportation Corps. Our role is not primarily advisory although we furnish officers to high level staff agencies to advise on transportation problems requiring special consideration. An example of this might be furnishing advice concerning the exploitation or even the destruction of the transportation network of a particular country, or a program for the production of transportation intelligence. Generally, however, we can maintain that our role is to design, construct, and exploit the organization that can produce the amount of military transportation required by a given situation. Without an established transport organization—properly conceived and executed—we would be incapable of performing our mission.

This requires commanders well versed in military affairs as well as in the more special technical activities of their branch. We have a vital role which becomes more critical as international events draw our country into conflict with other world powers. If we assume that we have only a limited responsibility and that the func-

tion of command should be left to other branches of the Army, then we should proceed to the obvious assumption that we should be divested of all military characteristics. Among these would be the military organization of the Transportation Corps, the maintenance of operational units, a corps of professional officers and men, and a developed and refined training system devoted to the creation of the necessary complement of personnel required for the accomplishment of our mission. The function of the Transportation Corps would be that of a group of technical advisors with no responsibility for, and no control over, the conduct of operations.

Forceful Executives

However, the trend of events prevents us from adopting such a limited role. The development of military transportation and the logistical aspects thereof has been greatly accelerated during the past century. Perhaps one of the most significant developments was the utilization, by the German General Moltke in the nineteenth century, of railroads to move his divisions from one portion of the battlefront to another. He realized that railroad transportation and the proper exploitation of this means of communications would enable him to shift his divisions at will. He could shift troops from a more or less quiet zone of the front and, within a short period of time, could hurl them against a vital point of the French defenses, providing quick exploitation of any points of weakness that might develop. Moltke's operations—revolutionary as they were—have paled into insignificance beside the United States Army's achievements in the past two wars. The German general had only to concern himself with a transportation medium of comparatively low speed and limited capacity. He was only concerned with the transport of troops over short distances; and, for the most part, food and ammunition were carried in the same train as the personnel. Furthermore, he was but little concerned with the problem of control as he simply ran a train to one point, loaded it with troops and supplies, and then sent it off to the locality designated as the area for the next operation. However, this operation paid huge dividends for the Germans as evidenced by the outcome of the Franco-Prussian War.

We, in the United States and other countries of the Western World, are blessed with a much more advanced and complex transport media. Highway, rail, air, and sea transportation—all operating at much greater rates of speed than in 1871—give us a much greater potential than that in the hands of Moltke's staff. Moreover, the scope of present-day transport operations requires well-disciplined organizations composed of trained and efficient officer and enlisted personnel. The great variety of logistical operations involving transportation units precludes the use of so-called transportation experts attached to a command.

In modern military operations a greater need exists. Military operations call for forceful executives, well trained in the military field, who are capable of sound judgment and decisions and are equipped to carry out these decisions. It is evident that the man at the top cannot carry out alone the myriad decisions that issue forth in one form or another from his

It would be disastrous to the mission of the technical services to assume responsibility only for the technical aspects of military operations, and to leave all command responsibility to the combat branches

command post. To execute his decisions, he must have a well-disciplined, effective staff organization, both to interpret his line of thought and to formulate the directives that are needed to implement statements of policy. These are the means by which he is assured of control over the conduct of his mission. Each decision assigns certain functions to individuals or units; to be effective, they must be directed to assure co-ordination of effort. Only a staff of trained and experienced transportation officers can assure that responsibility for movement of personnel and supplies is properly distributed among the various moving services.

The weight and volume of movement needs must be properly allocated and directed to ensure that movements are carried out in accordance with the established needs of the using agencies.

Each member of either higher headquarters or subordinate agency must be capable of carrying out the functions assigned to him. These functions may involve the command supervision of an activity of great magnitude such as a port complex or of a highway transport operation similar to those executed in France during the later phases of World War II or a "ship to shore" movement of supplies involving a DUKW battalion.

Such an effort requires a high degree of control and—from a military viewpoint—places great emphasis upon the operating discipline assuring this control. The command responsibility placed upon the commander of an amphibious unit is comparable to that of the commander of the assaulting forces themselves, although somewhat more restricted in scope. Upon the successful accomplishment of the mission assigned to the amphibious units depends the initial success, and ultimately, perhaps, the success of the entire operation.

Major Edwin B. Owen was graduated from Norwich University in 1942. During World War II, he served in North Africa, Italy, and France with Fifth Army and subsequently with Communications Zone, European Theater of Operations. He holds a Master of Arts degree in the field of international relations from the American University of Beirut. In 1952, he was assigned to the Foreign Liaison Office, G2, Department of the Army. The following year he attended the Transportation School. He is presently serving with the Europe and Middle East Branch, Operations Division, G3, Department of the Army.

Leadership

Leadership, which is one of the most vital elements of command, is at its height in this situation. For it is true that it is at the platoon, company, and battalion level that leaders are developed and upon whom the immediate responsibility devolves. Above the battalion level, the commander has much less contact with the body of troops and the element of leadership is not as vital a factor. There are those who will argue the latter assertion, but the argument can be resolved as follows:

The commanders of units larger than battalion strength are normally surrounded by selected staffs of officers who have progressed to the stage at which they do not need the example of a figurehead from whom they must derive the courage, will, or incentive to strive. Such persons are generally self-sufficient individuals who have been selected for their high professional efficiency, knowledge, and devotion to duty. They have to come to the realization that success lies in one's own proper endeavor and that co-operation and teamwork, rather than "follow the leader," are the factors which ensure the success of an operation.

The United States owes her position as a world power largely to the phenomenal development of land transportation on the North American Continent during the latter half of the nineteenth century. In turn, we owe our present degree of prosperity, in large part, to the creation of a

transportation system which has been capable of distributing the fruit of our production—at low cost and high speed—to the world markets.

Our future military success will depend upon how efficiently we can distribute the personnel and supplies to our combat forces. In this logistical effort, transportation will, of necessity, have a vital role. No weapon—no matter how effective on the proving ground—is of value until it can be delivered to the battlefield where it can be utilized against the enemy.

The Transportation Corps must provide the personnel and facilities capable of delivering this weapon along with the ammunition and spare parts to make it effective. There are many problems involved in the movement of such an article. Experienced personnel must be on hand to solve problems as they arise or, better still, to foresee and thus prevent their occurrence, with a consequent saving in time and effort. True, we have a tremendous potential of personnel qualified in the various fields of civilian transportation, whom we have used and will use again to great advantage. However, while waiting for these reserves to be absorbed into the transportation organization—after training them to most effectively participate in military activities which, perforce, vary in scope and nature from those common to civilian operations—we must have, ready for duty, a nucleus of trained personnel.

These will be the commanders of our organization around whom we shall organize our expanding operations. This hard core of trained officers and enlisted men cannot be produced overnight. They must be on hand when the situation arises, both to man the organization and to provide the cadres to train the incoming personnel. These commanders must be experienced officers who are fully cognizant of the role of military transportation, along with its capabilities and limitations.

Thus, it is evident that we cannot leave the responsibility for command to representatives from other arms and services who may, at best, have but a limited acquaintance with the technical, operational, and administrative problems arising out of transportation operations. In this connection, we are not concerned with the organic transport assigned to organizations up to and including division level. Our concern is with the units which are normally required in the support of combat organizations of corps level and higher, involving a complicated logistical operation.

Now we must provide the answer to the question of how a Transportation Corps officer should proceed to best equip himself for the responsibilities of command. To begin with, he should continually strive to increase his professional knowledge and to widen his scope of activity in the realm of transportation. By military schooling, continued study of general military and logistical operations, and selected assignments, he will acquire a firm foundation of knowledge with which to prepare himself for future positions of command in the field of military transportation.

Personal Responsibility

The officer himself is responsible for his future success and so should plan his career to assure that success will be achieved. Again he must plan his career with a view to obtaining the most benefit from his peacetime assignments. All the planning cannot be left to the Career Management people. They cannot visualize all of the problems of a career; many problems are peculiar to the individual. A large percentage of the time, their knowledge of your capabilities and shortcomings is confined to the information on your qualification card and, consequently, they are limited as to the extent to which they can advise you. To them you may be but a name on a card followed with a numerical expression representing your Efficiency Index. It is the responsibility of the of-

ficer himself to analyze his capabilities and weaknesses and to strive to overcome the latter and exploit the former. He must endeavor to fill in the gaps in his experience so as to ready himself for successful performance of future assignments requiring a resourceful and capable commander. A career must be planned; success depends upon the effectiveness of the planning. Unless we desire to take a back seat in future operations and are content merely to do the legwork—leaving the thinking to others—we must look for perfection today. We cannot afford to leave the functions and responsibility of command to personnel from the other arms. To do so would be to abandon one of our prerogatives.

Our role cannot be relegated to that of mere transportation consultants or advisors. More emphatically must we deny that the Transportation Corps is but a civilian component of the Army. The recent application of transportation to military needs and operations denies this beyond all doubt. We have been chosen as the leaders of present and future transportation operations required in connection with the mission given to the Armed Forces. Consequently, we are obliged to equip ourselves to successfully shoulder the responsibilities which will arise from our participation in these operations. In conclusion, we must consider the function of command as one of the principal duties of the Transportation Corps officer, as well as a right and a privilege, and, therefore, must dedicate our efforts toward our preparation for the performance of this duty.

Advances in the field of weapons enable the soldier to increase his firepower on the field of battle, and to wreak more effective destruction upon the enemy. Advances in the field of transportation—in planes and land vehicles—increase his mobility and hence his capability to exploit his firepower more effectively. Advances in the field of communications provide the means whereby the Army's firepower and mobility can be co-ordinated and controlled. Communication is thus an essential tool of the commander, without which control of his forces on the battlefield cannot be exercised. A battlefield commander without effective communications is in an untenable position, for his ability to influence the course of action is directly related to his ability to receive and transmit information and orders.

General Charles L. Bolte, Retired

REFLECTIONS ON MUTUAL DEFENSE ASSISTANCE PROGRAM

Lieutenant Colonel Daniel A. Raymond, *Corps of Engineers*
Instructor, Command and General Staff College

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

SINCE 22 May 1947, when the then President Harry S. Truman signed Public Law 75 of the 80th Congress, the Department of Defense has been in the business of contributing a major effort toward bolstering the military effectiveness of various foreign nations. Starting with the initial act of 1947, which prescribed military assistance to Greece and Turkey, this assistance program has now expanded to girdle practically the entire globe. The Mutual Defense Assistance Program (MDAP), so defined by the 81st Congress in an act of 1949, has as its purpose the aim of contributing to the security and independence of all freedom loving people by enabling them to maintain their national integrities through survival as free nations. Our contribution in this direction is aimed chiefly at raising the military effectiveness of the armed forces of these nations to provide for their individual and the free world's collective self-defense capabilities.

To implement our contribution, Congress prescribed that a limited number of members of the military services of the United States would be detailed to assist those countries—in an advisory capacity only. Further, the United States would provide for the transfer to these countries of any articles, services, information, instruction, and training necessary to accomplish our mutual objectives. Amplification of these implementing measures included the necessity for our military services to determine the types and quantities of equipment, materials, and training required; ensuring proper maintenance, operation, and use of United States equipment and materials; and ensuring the development of self-sufficient national training programs and the requisite training facilities required therefor.

After 7 years of endeavors in the prosecution of the MDAP, the United States Army can feel justly proud of its accomplishments in executing its portion of the programs. These accomplishments, however, have not been achieved without the trials and tribulations usually attendant to a new venture of such complexity and scope—nor has our experience so far assured us that further trials and tribulations will not be encountered.

This article is an attempt to assess the Army implementation of the MDAP in

Successful prosecution of the MDAP is essential to the continued existence of a free world. A long-range program, consistent with the needs of countries involved, is required for maximum effectiveness

one country and to derive therefrom "lessons learned" which may be of benefit in future endeavors of this nature. While the problems discussed are based on specific situations, it is believed that they are of a general nature applicable—in varying degrees—to other military Missions since they reflect conditions inherent in any such activity in a foreign country.

As is true with most "Monday morning quarterbacking," causes have been assessed by backtracking from effects and results. While some of the concepts developed appear obvious now, they were in many cases capable of initial definition only after lengthy processes of difficult "trial and error." The idea of mutual defense assistance was conceived and born in an urgent situation requiring immediate action to readjust the world balance of power, left so awry by the rapid demobilizations and war-caused disruptions in the free world at the end of World War II.

Of necessity, its early implementation and growth were nurtured in haste—with the attendant disadvantages thereof. Time and experience have clarified many of the vital considerations which were not apparent in the beginning. The initial mutual assistance program pioneers embarked on an uncharted course, feeling their way as they proceeded.

The initial prerequisites to implementation of a mutual assistance program in any country are: an exhaustive on-the-ground survey of the situation at hand; a thorough estimate of this situation to formulate conclusions based on facts derived in the survey; and a clearly defined course of action enunciated only after careful consideration of the estimate. While this procedure is standard in any proper military undertaking, and was followed in initial Mission endeavors, inexperience in this type of activity, as well as unfamiliarity with the countries involved, led to a lack of consideration of many important factors initially. This lack of appreciation of vital factors and failure therefrom to properly consider them was to affect the successful implementation of Mission programs. A discussion of some of these factors is offered for future consideration and thought.

Status Quo or Change

We Americans are quite often prone to assume that our military methods, systems, ideas, organization, equipment, and doctrine are without parallel elsewhere in the world, and that, therefore, we should try to revise others in our image. Applied to a Mission this assumption may lead us into an attempted conversion of a foreign army to such a degree that it will cause friction, meet resistance, foster misunderstanding, and seriously hinder the accomplishment of our objectives. It can magnify an already difficult task manyfold.

What we fail to consider in making the assumption that we should revise others to fit our pattern are the "whys," or "character factors" of our own military situation. It must be realized that our Military Establishment is the product of an evolution over a period of nearly two centuries.

From the embryonic establishment of 1777, we have progressed through a not unpainful process of growth and development which has been tied closely to our social system, our economic structure, our standard of living, our industrial expansion, technological advances in all fields of

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Lieutenant Colonel Daniel A. Raymond was graduated from the United States Military Academy in 1942. During World War II, he served with the 3d Infantry Division and with Amphibious Forces, Atlantic Fleet. He received his Master's degree from Harvard University in 1949. From January 1951 to June 1953, he was assigned to the United States Army Group, Joint American Military Mission to Turkey. Following his graduation from the Regular Course of the Command and General Staff College in June 1954, he assumed his present assignment as instructor at the College.

science, wars in which we have engaged, and the ever-changing pattern of aptitudes and skills possessed by the American people. Further, we have formed a general-purpose army designed to fight under practically any conditions in any area of the world. A foreign army, on the other hand, is similarly the product of character factors and will, therefore, reflect the influence exerted by such factors. Where wide variations exist between the United States character factors and those of a foreign power—as is frequently the case—an attempt to remake the army in our pattern will border on the impossible. In attempting such a revision we are asking another nation's army to set aside its historical lifetime of experience, methods, and customs and to adapt itself to a set of characteristics which it may not possess; this can lead only to bitter disappointment. Inertia, confusion, resistance, and ineffectiveness are inherent in such a situation.

For example, we take for granted that most Americans have some mechanical skills and aptitudes; are accustomed to the use of communications equipment in everyday life; are acquainted with elaborate transportation systems; have a high standard of living; and are literate. These are facets of our environment.

Consequently, we are likely to devise tables of organization and equipment (TO&Es) which require a great number of radio operators, mechanics, vehicle operators, other technicians, and are replete with creature comforts. These TO&Es follow our national pattern. Our industry can manufacture the equipment, our people can operate and maintain it, our economy can afford it, and for maximum efficiency we must use it—all in accordance with our environmental characteristics.

Take these same TO&Es into many foreign lands, however, and major difficulties may arise, for the skills, aptitudes, literacy, and the environmental habits of use of equipment may be completely lacking. To develop this essential background overnight is practically impossible.

What course of action then is open to us to "modernize" such a foreign army, if, in the interest of raising combat efficiency, it must be done in spite of deficiencies in basic background? The answer lies in a carefully chosen course which takes cognizance of the differences between the character factors of our two countries, and seeks to exploit the best of both in an efficient combination and which does not introduce changes merely to make their army similar to ours. In the long run, it may be much simpler and more effective for a few hundred of us to learn to understand and work with a foreign establishment and try to accomplish improvement within that framework, than to try to evolve an entirely new system for several hundred thousands, especially when the latter are unconvinced and, perhaps, rightly so, that their establishment is not a better one for their own particular circumstances. Thus, careful consideration must be given the character factors of a foreign army with every innovation of equipment, training, methods, and organization which we try to accomplish. In essence, let us ask ourselves the questions of how can desired improvement best be adapted to and integrated into their system with the minimum disruption to that system; and do these innovations fit their national character factors? A negative answer to the latter should be cause for concern.

Training and Schooling

Under the provisions of the MDAP one of the major areas of endeavor is in the field of the transfer of information, or training and schooling—especially as it pertains to the employment, care, and maintenance of the American equipment furnished. Into this activity goes a major effort of the Mission in the form of the

establishment, maintenance, supervision, and advice to the several service schools; transfer of training literature; as well as training teams in the field and technical and operational advisors at various levels. The objectives of this training and schooling and transfer of information are clear cut—to provide the necessary background knowledge, and technical and user skills to permit the efficient utilization of United States equipment and materials to improve the military effectiveness of the country concerned.

In practice, this endeavor has often started from scratch to fill voids caused by the nonexistence prior to the Mission era of some service schools or military activities, and even some branches of the service. There is unfamiliarity with certain types of equipment; and a general lack of understanding of the character of present-day warfare. In such instances an entire training situation must be created to include: provision of training literature and training aids; establishment of training facilities and methods; training of instructors; formation of doctrine; formulation of student criteria and selection; and school curricula. All elements should be aimed at the ultimate organization and establishment of an entire training system.

In the execution of such a task as that portrayed above, it is obvious that careful planning, phasing, and implementation of a sound long-range program are essential. Attempting to operate on a day-to-day basis—from crisis to crisis—can only lead to undesirable results of varying degrees. Further, first things must come first, and all elements of implementation must follow each other in logical, orderly fashion.

It would appear superfluous to state that an over-all training plan must first be developed, followed in order by: establishment of facilities; assignment of training facility personnel; provision of curricula or programs; development of training literature; training of instructors; provision of training materials; selection of students; an assignment policy for graduates to ensure their most effective utilization; and, finally, field observation of the results of such training. Unfortunately, it is all too easy to put the cart before the horse, or even fail to consider one or more vital steps in proper order. This is especially true in a situation where prior planning is not an inherent characteristic of the foreign army involved, and in which you are only an advisor and are not permitted to enforce action. Further, an individual step such as the provision of training literature—involving as it may a tremendous translation and reproduction problem—may be so slow and frustrating as to invite omission. This latter can lead to individual interpretations and adaptations of raw material, with a resultant dissemination of misinformation.

One apparently simple step above—the selection of students—may well be the Achilles' heel of the entire effort if it is not carefully considered. In the United States Army, we naturally fall into the pattern of applying the bulk of our training and schooling to our younger officers, noncommissioned officers, and soldiers to meet our needs. Such personnel then return from schools or training to military duties where their newly acquired skills or knowledge are put to use. This system works for us since our Military Establishment is based on a process of feeding new personnel into a broad base. Those on echelons above the base are well qualified by virtue of experience and similar schooling and training to absorb and utilize personnel fed into the base. This concept applied to a foreign army undergoing Mission advise can be fallacious, especially where the Mission is embarked on fulfilling a program involving radical changes of the foreign establishment on a major scale.

In such a situation, it is necessary that the foreign army be converted to new

ideas, equipment, and methods from the top down, rather than from the base up. Conversion at the base only may result in a waste of training, for nonutilization or resistance to nearly acquired skills and knowledge may result. A situation may well arise in which senior officers are put in the embarrassing position of knowing less about new equipment, new formations, new procedures, new techniques, and new operational methods than their juniors. When this happens the seniors can, in general, hardly be expected to utilize the newly acquired skills and knowledge of the juniors effectively. Direct resistance and resentment may arise, especially when "face" is involved. Only careful attention to the proper direction of training can avert major difficulties in this area of consideration.

Maintenance and Supply

The MDAP involves as a paramount feature the introduction of United States military equipment and supplies into the army of a foreign country to increase that country's military effectiveness. Unfortunately, this introduction is not usually a single transaction of give and take; it also involves the processes of maintenance and supply. Since a main purpose of any Mission is to ensure proper utilization and maintenance of the United States equipment furnished, this involves our participation in these vital fields of logistics.

United States maintenance and supply systems are peculiar to our Military Establishment; they reflect our character factors discussed earlier, and may bear very little resemblance to those systems existing in the countries in which we are interested. Procurement, maintenance, and supply by the several technical and administrative services in the United States Army and the further division into classes of supply is a concept not easily explained to, or understood by, a foreign army. The lack of similarity between the United States Army and foreign army systems is especially evident where the foreign army has previously contained very little automotive or electronic equipment. Trying to resolve the differences between the two systems—or to integrate two possibly widely diverse operations—can be most difficult. The problem can involve the complete establishment of new supply and maintenance systems and the elimination of existing inadequate substitutes. Those who have ever tried to operate equipment or a facility without benefit of either an operating supply or maintenance system behind them can appreciate the effect of timeliness of the establishment of these systems in a Mission. Needless to say, by the time the first item of aid equipment arrives in the country, it should have both these components of logistical support established for most effective utilization thereof. The difficulty arises in that logistical facilities themselves require equipment, supplies, training, and supervision which cannot precede their establishment.

The maintenance and supply facilities, organization, personnel, and systems must be developed to high standards of operating efficiency very early in the life cycle of any Mission. This activity in itself must become a major effort of any Mission, coequal only with training. It cannot be slighted in favor of the latter, although this tendency may arise. Any slighting or lack of emphasis in the logistical support phase of Mission activity will ultimately be felt in the training accomplishments.

Early in the planning phase of Mission operation, the maintenance and supply systems must be thoroughly integrated—on a long-range basis—in a schedule of implementation developed to co-ordinate the growth and efficiency of these systems with the influx of equipment and materials, and the training programs—all of which are interdependent. The co-ordination of training and logistics cannot be emphasized too strongly.

In Mission logistical planning, it is well to develop at as early a date as possible experience factors for the replacement, replenishment, and maintenance of material. Experience has shown that factors developed for the United States Army use may be invalid for a foreign army using the same matériel because of different operating conditions, different characteristics in the using personnel, different standards of maintenance, and even the different temperaments and philosophies involved.

In the development of these systems simplicity must be a prime consideration. Admittedly our systems are complex, but need all this complexity be transferred in miniature to the foreign army? Qualified personnel without prejudice or bias should develop a system best suited to the needs and characteristics of the army concerned. It may be considerably easier to adapt their system than install ours. Some aspects of our system, such as nomenclature and catalogues, must be transferred since we are the source of supply. Need we, however, dismember a general supply service a foreign army may have and substitute our multibranch system? Cannot a single general maintenance service suffice for a foreign army's purposes —rather than our multibranch system? Will not general depots suffice rather than branch depots? These considerations are especially pertinent if the volume of supply and maintenance is comparatively small and the functions of research and development and procurement are minor in extent. Without the volume or functions to justify it, our system becomes extravagant in overhead by a duplication of facilities and effort, difficult to promulgate, and cumbersome and confusing in its many aspects.

Since command supervision is essential to the effectiveness of supply and maintenance activities, positive, early action is necessary to ensure that commanders and staff officers in positions outside the systems are instructed and oriented in their organization, functions, purposes, and procedures. Should this instruction and orientation be neglected or overlooked, command supervision may be limited to complaints, inaction, or, at worst, ill-considered corrective action.

Equipment

After determination of the troop basis to be supported in order to meet the objectives of the country concerned under the MDAP, then arises the problem of arriving at tables of equipment necessary to make those units effective. Selection of equipment can be wrought with pitfalls for the unwary.

Here again, those character factors discussed earlier enter into the picture. Before our equipment is made available to a foreign army, a study should be made to determine its compatibility with the character factors of the foreign army. Factors which led to the development and adoption of an item for our Army may be completely different in another army.

In the interests of simplicity in procurement, maintenance and supply support, training, and employment, it is advisable to keep the number of types and models of various items of equipment as low as possible. Because of a lack of long-range continuity in programming, vacillating program policies, and the early depletion of some initially available stocks in the United States, however, this concept is sometimes violated. In some major items, for instance—involving a total quantity of only a few hundred pieces—as many as four or five different models, makes, and types of an item were delivered. Complications resulting from this practice were manifold, especially in spare parts supply, maintenance, training, and replacement.

With many United States items of equipment—especially in the electronics and

automotive fields—we are inclined to minimize their complexity and take for granted the support necessary to keep them operating. This fact becomes painfully obvious when such support is lacking or inadequate. Support-wise, we too frequently overlook the support rendered our equipment—from the financial standpoint. Fuel, spare parts, replacement items, and expendables assume their true relationships, support-wise, when we realize that only a comparatively wealthy industrial economy can afford them on the scale the United States Army uses them. When this support must come from the meager military budget of a country which has little or no heavy industry, we realize that items must be considered in the light of necessity and worth versus cost. We are not accustomed to weighing these factors, because our apparent necessity is usually paramount and we usually afford what we feel we need.

Lack of consideration of the economical impact of some United States Army equipment on a foreign country can lead to waste and misuse of equipment. As an example, we have gone in heavily for motorization of our Mission partners on a large scale in the interest of mobility and efficiency. In at least one instance, this has resulted in many vehicles being deadlined for lack of fuel, and, in many cases, the restriction of training use of vehicles. They are too expensive to operate on the Nation's present military budget. Furthermore, illiteracy, lack of technical aptitudes, lack of money for spare parts, and lack of national experience with automotive equipment make the provision of mechanics, drivers, and supervisory personnel a continually pressing problem which is usually inadequately solved. We must ask ourselves whether in such a case we have really raised efficiency and increased mobility in providing equipment which at present can neither be adequately supported nor properly utilized. Adequate support of equipment—skill and facility-wise, as well as economically—must be assured before it is made available, or we must be willing to provide the difference.

Laissez Faire

United States Army Mission activities are theoretically confined to the apparently limited fields of supply, maintenance, training, and the supervision and advising with respect to these fields—all are pointed toward the single goal of increasing the combat effectiveness of a foreign army. If these fields could be defined practically in a narrow sense, and if we could then limit ourselves to these fields, our task would be simplified. In practice, however, so many aspects of military activity are so closely interrelated that we frequently become involved in matters which are not properly legitimate concerns of ours—often with unforeseen consequences.

Take, for example, a situation wherein we discover that in a country where available military manpower is in short supply, several thousand men are being used as officers' orderlies. With the practical purpose in mind of bringing existing units up to strength, in order to increase training effectiveness, we recommend the abolishment of officer orderlies. Logical? Apparently so, but in this recommendation we unintentionally invaded the morale field. The orderlies in question have long been considered a part of the officers' pay and perform invaluable functions—substituting for the Post Exchange tailor, the Quartermaster laundry, and many other necessary service agencies to which we are accustomed.

In similar instances, we often find ourselves inadvertently going far afield from our agreed purposes. We may, for example, try to introduce our system of leadership—based as it is on our hereditary concept of the equality and dignity of men—as a substitute for a paternal

system which is equally effective, traditionally strong, and better suited to the local conditions.

We may—unless we are careful—find ourselves unduly concerned about soldiers' living conditions which may seem to us substandard. In attempting to improve them we may try to increase the creature comforts of their soldiers despite the fact that those which they have are more in keeping with their national standard of living. Ours may well be unappreciated, inapplicable, and too expensive.

We have a tendency—most of us—toward social uplifting and can—without realizing it—devote too much energy to such efforts. Instead of contributing to our objectives, this may well involve us in effort-dissipating activities which do not serve well the countries we are trying to help—it may, in fact, contribute to dissatisfaction.

Only by a searching study of the implications of proffered innovations and the use of commonsense can we avoid stepping out of our prescribed duties and interfering or upsetting phases of life in which we should not be concerned. A little thought in this connection can prove valuable to all of us engaged on Mission duty, and may save us from creating problems greater than those which we "solve." It is well to remember the good intentions with which the road to hell is said to be paved.

Supervision, Advice, and Operations

Under the provisions of the MDAP and by contractual agreement with the countries concerned, United States military personnel assigned to Mission duty are stationed in foreign countries to act in an advisory capacity only—being specifically forbidden from assuming any command functions. While at first consideration the distinction between advice and command appears clear cut, there are three difficulties inherent in differentiating between the two. First, there is the operational area of activity between advice and command which is not easily distinguished. Second, advice carries with it no authority to enforce activity, yet advisors within the framework of a Mission do have responsibilities to the United States for the accomplishment of Mission objectives—responsibility without authority is not an easy mantle to wear. Third, what is advice? What forms can it take? Do we wait until it is asked for or proffer it unrequested? Can advice always be given tactfully or must it on occasion be pressed on the recipient? In the latter case we are bordering upon command.

It is possible in many instances—in spite of desires to the contrary—to become involved in operating foreign army activities—especially those activities with which the foreign army has had very little or no experience. In such a case, it may often be necessary to become involved in all functional aspects of the activity. Such involvement can be of great benefit to the foreign army and ourselves and may well be gratefully received—depending, of course, upon the atmosphere of the personal relationships developed, and the apparent necessity for our involvement.

The camaraderie of the profession of arms can be expected to provide an initial common meeting ground for the advisors and the advisees, but an atmosphere of mutual trust, confidence, and respect must be nourished to full growth—in both parties. It is unfortunate that some of us have placed ourselves in the position of expecting trust and confidence without extending the same to our foreign associates.

As a group we usually enter a foreign country preceded by prestige, respect, and confidence in our abilities—sometimes, perhaps, too much so. Only by the most selfless devotion to duty and by the demonstration of professional competence through tangible results can we maintain our standing. Bearing the standards we

carry, high and untarnished, is not a task to be undertaken lightly.

In all of our foreign Mission endeavors we must seek to develop the capacity for, and then transfer as soon as practicable, the responsibilities for results to the foreign army. While our initial assumption of these responsibilities is quite often necessary, they must be relinquished and passed on as early as feasible. Care must be taken that we serve only as an initial prop of experience, knowledge, and direction and that we do not continue as a crutch when the prop is no longer needed.

Advising is a matter of salesmanship. We can offer—and extoll the virtues of our offerings—but we cannot force the customer to buy a new approach to the military profession. This task calls for tact, reasoned and logical appeals, and explanations of worth and need which most of us encounter infrequently in our own service. The "you will" we are so accustomed to using becomes "you should, because."

A sometimes discouraging aspect of advice Mission-wise is that it may be sought too infrequently. A policy based upon sitting back and waiting for others to come for advice will not normally achieve results. This is especially true where the benefits to be gained from such advice are not apparent, or where there is a failure to appreciate that there are different methods or approaches to a problem—or that a problem exists. Advice in such a situation must be proffered with extreme care for the sake of your advisees' pride and prestige. It is often best offered as a suggestion—in private—to your foreign counterpart with a recommendation that he use this idea as his own. There is little place for pride of authorship or origination among Americans on a Mission.

There are times when advice must, for all practicable purposes, be forced upon your advisees, especially where responsibility to the United States demands such action in the protection of our interests. A failure to do so may result in failure to support our own Government's objectives. These are the cases which try men's souls and call for firmness, courtesy, and extreme tact. It can be done if you have established your prestige, value, and trust among your foreign counterparts. Note I say among your foreign counterparts, for that is where you must have established yourself anew on Mission duty—regardless of your professional standing within your own service.

Laws and Regulations

A final word on advice and that with regard to where it should be applied: To be most effective an advice chain must be established throughout the entire foreign military establishment from the highest levels of command and staff to the most remote units in the field. Advice must be followed up and must continually be assessed. The effectiveness of units and activities must constantly be checked and evaluated. The commander of a Mission must be able to evaluate continually and effectively his Mission's progress and its areas of deficiency in order to concentrate his efforts where they can do the most good. Advisors placed in only a few areas of activity—such as the highest staffs and major training and logistical establishments—will soon find themselves relying upon inadequate information or even misinformation and subsequent inaccurate evaluation of the program. Their efforts will, thereby, be misdirected or applied ineffectively. Advisors should be located initially at all command and staff levels down to and including independent battalion size units, in all training establishments, throughout every major link in the logistical chain, and in all governmental agencies which are critical to the military establishment.

One particularly frustrating aspect of Mission activity is the impact of unfa-

miliar foreign laws and regulations upon our efforts. Too frequently we overlook the fact that our own procedures are quite restricted, defined, prescribed, and channelized by a maze of laws, regulations, and policies, and that the same situation may exist in a foreign army. As a consequence, our actions are often blocked without apparent reason because of our failure to consider this vital factor. We have been guilty often of incomplete staff action in this respect.

Whenever a change is indicated in the organization, training, logistical system, conscription program, or practically any area of military activity in a foreign army, there is a strong likelihood that implementing legislation, decrees, regulations, or new policy must accompany such change to effect it. It is vital from our standpoint that the implications of such changes be clearly understood and that a competent legal section scrutinize all activities with a view to determining necessary legal implementation.

Our supply system is a prime example of an activity which is replete with controlling laws, regulations, and policies. Any efforts to transfer to or establish our system in a foreign army must take cognizance of this fact. An attempt, for example, to institute our accountability and responsibility concepts or salvage procedures must be accompanied by implementing legal action.

As an example of difficulties which are likely to be met in only one limited phase of activity, here are some problems related to instructors which have been encountered in service schools. A section was established to teach all combined arms subjects, with appropriate instructors obtained from the branch operating the school. Initially, however, instruction was stalled when it was discovered that only General Staff Corps officers were "qualified" by regulation to teach such subjects. A further example occurred in what appeared to be a case of the "reluctant instructors" who resisted undertaking what appeared to be a reasonable number of platform hours each week. This "reluctance" was resolved only when it was determined that, by law, officers instructing more than a certain number of hours had to receive extra pay, and the necessary funds were not available.

Problems

In still another case, an apparently difficult disciplinary problem arose when it appeared that some instructors were either irresponsible or incompetent and were, therefore, continually obtaining noninstructor members of the school staff to act as substitutes for them on the platform. After much recrimination and expressed dissatisfaction on our part it was determined that officers assigned to noninstructor billets could augment their pay by undertaking instruction—naturally they took every opportunity to do so with their instructor contemporaries co-operating.

A final example of the importance of the legal consideration occurs frequently in the field of contractual law. United States personnel designated to supervise a limited construction project established specifications and standards of performance which they considered necessary to ensure acceptable construction. Compliance with these standards, however, could not be obtained, for they had no legal basis according to local codes and practices.

These are but a few samples of the obstacles encountered through failure to consider the important aspect of legal implication. A staff judge advocate can forestall many major problems by a search for effect and impact beforehand and by recommending necessary implementing changes to laws, regulations, and policies as essential components of prospective actions.

Perhaps in no other area of Mission endeavor can greater effectiveness be assured—or more damage forestalled—than

in the selection and preparation of personnel destined to serve with a Mission.

It goes without saying that Mission personnel should be professionally qualified to fulfill their assignments. What must be considered additionally, in this respect, is that many Mission personnel will serve in positions of higher responsibility, with less supervision and counsel, requiring more initiative and "self-starting," than in assignments they would be likely to receive within our own Military Establishment. For example, it is a possibility that sergeants may find themselves acting independently as advisors to battalion commanders, and that colonels find themselves advisors—in all fields of activity—to army commanders. Only the highest caliber personnel, with above average qualifications and character, can effectively fill such billets. Incompetence, misassignment, or any dereliction of duty can result in Mission ineffectiveness, loss of United States prestige, and lack of confidence which results in a failure to follow our advice. A Mission is no place for misfits or persons of marginal qualifications of questionable character—the stakes are too high and the results too important. Each individual assigned to Mission duty must be considered in light of the effect he may have as the sole representative of the United States with whom many foreigners will come in contact—he may well be the only tangible evidence of our presence in a foreign country in a given area.

As important as personnel qualifications are in the military sense, they can be of little value unless the personnel are well equipped with a knowledge of the country in which they are serving. Military assistance cannot be separated from the language, sociology, culture, economy, history, government, traditions, religion, geography, and laws of the countries in which the MDAP is being implemented. All are interrelated to the military establishment—in fact constitute or affect the basic character of the country's military forces. *Per se*, then, an acquaintance with the basic fundamentals of all these elements of character of a nation is essential to effective participation on our part in a country's military efforts.

In this respect we have been somewhat remiss. Gaining knowledge of another country has been left generally to the individual or limited to a brief orientation which is hardly sufficient. The net result is too often an approach to problems which, from the foreigners' viewpoint, apparently is unintelligent, ill considered, and may be even ridiculous.

One American officer, for instance, in discussing the development of unit esprit in the United States Army, stated quite proudly that some of our Army units had battle records covering a period of almost 150 years. This officer then implied to his foreign military audience that it was unfortunate they did not have similar battle records on which to build unit esprit. In actuality, the foreign units in question had proud battle records covering 500 years. Needless to say the officer's prestige and credence were destroyed in that discussion. Furthermore—and not without justification—the foreign officers felt resentful that their traditions and glorious past were so slighted. This is only one example, but typical of many arising from self-imposed ignorance.

We could reap dividends with little effort on our part were we to institute formal indoctrination of all personnel assigned to Mission duty. It need not require elaborate nor expensive facilities. An intensive course of short duration would suffice in most instances and enable us to execute our complex assignments more effectively and with greater confidence. Our reception in foreign countries would be more favorable. Furthermore, this indoctrination should extend where possible to the wives and older children.

In addition to the knowledge of a foreign country, indoctrination in the concept, purpose, functioning, and implementation of the MDAP is also essential. The MDAP and its economic counterpart are misunderstood in many of their aspects. The common concept heard and expressed too often among Mission personnel is that they are "give-away" programs—closely related to charity—which is entirely one-sided and for the benefit of the foreign power. Such impressions are not likely to engender attitudes conducive to good results. The fact that aid is for mutual defense, the development of mutual strength, and that there may some day be considerable returns for the free world must be impressed on and understood by all military personnel.

National Policy

In the original promulgation of the MDAP, our intent was to enhance the free world's security by assisting those countries sharing our desires to resist the forces of aggression should the necessity arise. This program recognized that the nations concerned were at the time unable, within their own economic and industrial resources, to afford the military strength which would be necessary to effect the policy of mutual defense. In the companion act to MDAP—the Foreign Assistance Act of 1948—it was intended that the economic standards of the MDAP countries would be raised to enable them to support their own necessary military forces as soon as possible. Our purpose under MDAP was to provide the sinews of their military establishments until economic self-sufficiency was reached. This concept was misunderstood by many who believed that military aid could and should be a "one shot" program—existing at most over a few years. Instead, our support under the MDAP is still being granted and bears indications that it must be continued indefinitely.

Each year, as annual appropriations are sought for the continuance of the MDAP, there appears to be growing resistance to approve them among some elements of our Government, even to the extent of inflicting arbitrary reductions in the sums requested. The policy of arbitrary reduction—and the clamor for discontinuance of the MDAP—can lead us to disaster. The stark reality of the situation is that in some areas of mutual assistance the minimum programs, instituted to ensure adequate military strength, have resulted in the establishment of military forces which the countries concerned cannot now and in the immediate future will not be able to afford.

A military machine is—as we all realize—not an implement which can be built up on a one-time basis and then set aside for future use. Unfortunately, it is subject to deterioration and obsolescence, and expends itself—equipment-wise—even in peacetime. It requires continual support in spare parts, replacement items, improvement, and expendable materials—particularly training supplies, ammunition, and petroleum products. It would be extremely shortsighted for this country to arbitrarily discontinue support to those military establishments we have now built up and which are beyond the capabilities of their own countries to support. If we are to have continued mutual defensive strength in conjunction with these countries we must continue support for an indefinite period. Should our support cease, some of the military forces we have strengthened—at such great cost and effort on our part—will be of very little effectiveness within a short period of time. Our initial investment in strength will have gone down the proverbial "rat hole," as the hardware provided deteriorates and falls into obsolescence, and the expendables are consumed.

There is still another effect, although by no means as important as that discussed above, which a vacillating and ar-

bitrary attitude has upon Mission effectiveness: that is in the field of long-range planning. Where major reorganization, revitalization, equipment, and training programs have been instituted, they of necessity have been phased over a period of several years. In this long-term phasing there has been a progressive development planned, with yearly increments of growth and improvement blueprinted. Such plans are made in good faith and with the expectancy, of course, that they will be met. Inherent in such planning is knowledge thereof to at least a limited degree by the planners and higher echelons of the foreign army concerned. It is not difficult to imagine the effect on such plans of a vacillating policy on our part. Since the plans consist of many facets and are cumulative in their benefits, nonfulfillment or changes in various elements have a chain reaction effect on the over-all development, and a "crash" programming often results. We have often been accused of being confusion creators and even of breaking faith—and not without some justification. As far as foreign armies are concerned, they are often reluctant to participate in some of our most far-reaching plans because of a lack of definite long-range assurances from us, and because experience has shown that there is apt to be considerable difference between our plans and deeds. They do not desire to find themselves out on a limb, with the limb cut off behind them.

In summary of this aspect of the MDAP, it can be stated that for maximum effectiveness we need a long-range program consistent with the needs of the countries involved. It should permit of consistency and good faith on our part and be of sufficient duration to ensure effectiveness of the countries concerned for as long as is necessary to provide for our mutual security. It should be free of arbitrary fluctuations in scope and value and not subject to political "footballing." The MDAP is an extension and complement to our own Armed Forces—vital and necessary for as long as the free world is menaced.

We have sought to eliminate economic aid in Europe as pure budgetary support. Exceptions are where this is necessary to maintain military establishments which directly benefit us and which cannot be maintained to the degree deemed desirable by our military advisors without some support from the United States.

The case of Turkey illustrates this point. Turkey maintains about 20 divisions of splendid fighting quality at a strategic location. The Turkish economy cannot support this without some assistance and, therefore, the mutual security program makes provision for this. We believe that the money spent in this way brings a greater return to the United States in terms of its own security than if it were spent in some other way or if it were not spent at all.

Secretary of State John Foster Dulles

ARMY ORGANIZATION FOR LOGISTIC SUPPORT OF FIELD OPERATIONS

Lieutenant Colonel John H. Elder, Jr., *Corps of Engineers*
11th Airborne Division

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

MILITARY publications and journals reflect a growing concern for the organization and management of that part of the Army known as the "logistical support structure." The Secretary of the Army has recently announced a plan for top-level reorganization of the Department of the Army based upon studies from his viewpoint as the Secretary of the Army. Countless Army agencies in the lower echelons continuously study the same problems from the user standpoint—from the bottom up. It is significant that all these studies recommend change, although no true common basis for change, both from top and bottom, is proposed. Perhaps some common ground exists in the changes recommended and this common ground can be found by examination of the problem, its history, and some of the solutions proposed. Perhaps a common solution may be found in the history itself.

The present basic departmental structure of the Department of the Army comprises a Chief of Staff level, a General Staff level, and a Technical and Administrative Staff level. Department of the Army Technical and Administrative Staff chiefs are assigned dual functions in that they also head technical and administrative service structures extending, through various command levels, throughout the Army. In this latter capacity they may command troops and installations and are responsible for the development of the organization, doctrine, matériel, and tactics and techniques for troops and units of their branches or services wherever they may operate.

Traditionally, the Department of the Army staff functions of the Technical and Administrative Service chiefs have been a reflection and a projection of their responsibilities as branch or service chiefs. Their origin lies in the semiautonomous bureaus existent prior to the twentieth century; the staff functions now assigned were superimposed onto the bureau chiefs as ever greater operational controls were required and devised and as the present concept for a co-ordinating General Staff was developed and adopted.

Traditional Service Missions

The traditional functions of the Technical Services as they existed just after World War I were:

Ordnance Corps.—Supply of weapons and ammunition for the Army in the field.

Quartermaster Corps.—Provision of all things necessary for the subsistence of the Army, including transportation and camps and excepting weapons and the ammunition therefor.

Medical Corps.—Provision of medical service and care for the Army in the field.

Signal Corps.—Provision of communications for the Army in the field.

Chemical Corps.—Provision of the means for employment of and defense against chemical munitions.

Engineer Corps.—Construction of field works and lines of communication, and provision of topographic and mapping services.

The ever-increasing complexity of weapons, organizations, and the over-all field military structure so increased the magnitude of the traditional mission of the Quartermaster Corps and the balance between the various Corps that, following the institution of a General Staff charged with the function of co-ordination, the Quartermaster mission was more restrictively defined with elements of its mission reassigned to other existing, or newly organized, technical services. For example, during World War II, elements of this mission were located as follows:

Ordnance Corps.—Supply of vehicles.

Engineer Corps.—Construction and maintenance of bases and camps.

The newly organized *Transportation Corps.*—Transportation for the Army.

All these traditional missions are expressed as functions; inherent in them were supply of equipment and matériel peculiar to the basic branch or service function, maintenance thereof, provision of training in skills peculiar to the branch or service, and procurement and control of personnel with skills peculiar to the branch or service. These inherent elements of the functional branch or service mission were contingent upon the task constituted by the specific service mission in a particular situation and were not in fundamental conflict with the basic assignment of supply responsibility to the Quartermaster Corps and the Ordnance Corps. The growing totality of war, however, has required increasingly close General Staff or even executive level procurement and production control (such as the Army Service Force [ASF] and Office of Defense Mobilization [ODM]) to protect the national economy and to minimize the impact of wartime procurement on it.

Technical Complexity Increased

Paralleling the growing complexity of combat operations there has arisen a requirement in field units for technical equipment which was once peculiar to a technical service functional mission and, hence, was the original supply responsibility of that technical service. These items, thus, have become requirements both in the technical service mission and in the basic mission of supply to the Army in the field. Under the very real pressures arising from the necessity of achieving those economic gains possible through procurement in quantity, and of minimizing and controlling impact on the national economy, responsibility for provision of the pseudotechnical and specialized items, army-wide, has generally been assigned into that technical service having the original functional interest in the item. This, in the aggregate, has ballooned the once embryonic, completely internal, supply missions of the several technical services into worldwide supply operations throughout the depth of the Army structure—often to the detriment of both the new and the traditional mission through the dilution and diversion of effort from a single clear-cut objective into diverse and sometimes obscure ones. This method of at-

If our present logistical system is to be indicted because it has not been responsive to the requirements of the combat forces and because it has imposed administrative burdens, let us seek out the true culprit

taining economy—although the end in itself is essential and commendable—has been, at best, a departure from the time-honored principles of "objective" and "economy of force," and an expedient and stopgap solution, the ultimate consequence of which has been chaos and confusion in supply and maintenance operations for the unit commander or supply officer in the field. No longer in our "modern" Army can the battalion or regimental S4 go only to the supply service—the Quartermaster—for his general supply or maintenance. Now he must go to Quartermaster supply, Ordnance supply, Transportation supply, Signal supply, Engineer supply, Medical supply, Chemical supply, or to the various branch maintenance units to fulfill his unit's seemingly simple needs. In order to determine where he must go requires that he pore through a veritable maze of regulations and literature. To replace the mason's hammer or side-cutting pliers in his Engineer-issued pioneer set, he must visit the Ordnance supply officer. To secure supporting maintenance or even spare parts for the generator with his Signal-issued communications equipment, he must seek out the Engineer Maintenance Company.

Corollary to this, no longer can the commander readily control his support effort through clear-cut, well-defined channels of staff responsibility based upon end performance of missions. This is evidenced by the increasing reliance of commanders on G4 general staff control over technical service operations and the tendency toward "support commanders," in order to free themselves of the details necessary to now fully control support operations. This can achieve the necessary ends only at unreasonable cost in staff overhead and in the ability to truly and directly command the entire operation.

The Functional Concept

These unrealistic and unworkable field procedures imposed upon the small unit commander have led the Army to ever increasingly seek for methods whereby these evils may be rectified and the burden on the field commander eased. A nostrum has been suggested for this—a "functional" organization to be applied partially in the communications zone and totally within the field army and its subordinate elements. Under this "functional" concept, an "L" staff—L1 (Requirements and Procurement), L2 (Receipt, Storage, and Issue), L3 (Movement), L4 (Maintenance and Repair), L5 (Facilities)—or similar structure is to be superimposed onto and into the communications zone to provide a closer control over logistical operations. Within and under the jurisdiction of the "L" staff, technical service responsibilities will, however, remain unchanged although these staffs may be located differently within the over-all organization. The various command elements under the general supervision of the "L" staff include geographical Area Commands and functional Construction, Supply, Maintenance, Communications, Medical, and Personnel Commands. Some of these commands will be comprised primarily of units of a single branch, while others will include units of the several branches and composite units as well. In the field army itself—as in the division—although the "L" staff may not exist, the same functional commands are proposed.

This organizational realignment does not solve the problem; it merely relocates

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Lieutenant Colonel John H. Elder, Jr., served in Europe during World War II. He was Post Engineer for Ordnance Depots in Ohio and Indiana for a 2-year period and, in 1950, went to Korea where he was assigned to the 19th Engineer Combat Group. Upon his return to the United States, he was with the Engineer Section, Office, Chief, Army Field Forces. Following his graduation from the Regular Course of the Command and General Staff College in June 1955, he was assigned to the 11th Airborne Division.

it and superimposes another control strata to reduce malfunctions. The burden of transforming a 7-technical service supply system at departmental level into a system at field level—more readily grasped by and simpler to the unit commander—is merely transferred back to the communications zone area. It is fitting and appropriate that this adaptation of the system take place far behind the user—but is it really necessary that it take place at all? Can we afford the personnel—service, not fighting, personnel—necessary to rearrange and sort out a flow of supplies within the logistic pipeline? And if we must separate supply from service with the logistic pipeline, can we truly afford to separate the Signal officer who must provide the communication service from the control over his means—from his supply and his maintenance—or the Engineer who must construct from his construction equipment and material? I maintain that we cannot.

Can we not then find another solution, economical of manpower, responsive to the combat user, and yet adaptable to the needs of those responsible for the operations essential to effective combat support? To do so, we must re-evaluate essential functions and the shifts of responsibility which have made all services into supply services and which have diverted attention from the basic, essential, and truly functional missions.

Essentials of a Solution

The crux of this matter is in the determination of the characteristics which are essential. Time and usage—helping us—have established the following characteristic principles:

1. The support system must respond rapidly to the requirements placed upon it by the combat forces.

2. The support system must be simple and impose minimum administrative demands upon the user.

3. The support system must be economical of operation within itself and must be operable under austere conditions.

4. Responsibility must be clearly defined at all levels and must not be duplicated within any single level.

In the process of re-evaluation we must also remember that history proves that successful response to a challenge lies "neither in idolatrous worship of ephemeral techniques nor in a jump into Utopia in a time machine," but in considered development from that which is known and proved toward that which may be conjectured. History also proves that no structure nor economy is sounder than its foundations. Added props are, at best, a temporary palliative; true remedial action can arise only from a better-founded base.

The present logistic structure within the Army violates, in some degree, all the principles above; primarily the first two. It is maintained that it is unresponsive in some cases to the demands of the user. It is assuredly not simple and it does impose excessive administrative demands upon the user. It may be reasonably economical of operation within itself but supply and maintenance responsibility are duplicated between technical services at all levels, and a heavy burden of coordinating staff sections and even committees is borne.

The proposed "functional concept" attempts to make the support structure more responsive to the needs of the user by centralizing all support functions under a single commander at field army and theater level. It attempts, thereby, to assure co-ordination within itself and a consistently articulated response although it does not provide a new solution to co-ordinate action in operational and logistic solution of a command problem. It attempts to minimize administrative demands upon the user by providing him a single source from which to derive the various types of support which he may

require—supply, maintenance, or personnel service. It makes no apparent major gain in internal economy and continues to apply the single procurement and stockage responsibility assignments included in the present system. It clarifies responsibility by assigning logistics to a single commander at each level, although beneath him—behind the field army—branch responsibilities are unchanged.

The Illusion

The increased responsiveness purported for the "functional concept" is illusory. Resolution of conflicting requirements and demands between the user and the supplier must, under the "functional concept" concept, be carried through the additional support commander to the general staff and the major commander, whereas, these conflicts are now carried directly to the general staff and to the commander. The "functional concept" also separates the builder from building supply, and the communicator from communication supply and imposes a new burden of co-ordination at this level for which new co-ordinating staffs are needed. It considers that the only user is the Army combat user. In truth, the technical services, within their traditional functional missions, are primary users. The separation of the Signal officer from the supply of communications matériel, the Engineer officer from the supply of fortification matériel, lessens true responsiveness in this area since, first, the technical service operator and, second, the technical service supplier must now respond rather than a single entity. True, the proposed system does minimize administrative demands upon the user and does provide for him a single source toward which to turn for supply, for maintenance, or for personnel services. However, as stated previously, it does not gain real economy in internal operation nor does it more clearly define responsibility since to and within the communications zone it adopts and continues presently assigned branch responsibilities.

The functional concept" is a departure from traditional and proved United States Army concepts for support operations. It assigns areas of operating responsibility and interest within the communications zone and within the field army which are outside the present realm of experience and training of the officers of the Army in the lower grade levels, although no system is sounder than the foundation of trained personnel upon which it is erected.

The True Offenders

If the present system is to be indicted because it has not been responsive to the requirements of the combat forces and because it has imposed administrative burdens upon the user, then let us search out the true offenders.

The system has been unresponsive because technical services are assigned procurement, supply, and maintenance responsibilities outside their traditional missions —outside the individual experience and competence of their trained personnel and outside their areas of operating knowledge. The present system has sacrificed the single clear-cut objective in individual technical service operation. The system has imposed excessive administrative demands upon the user arising from these same basic reasons. It has permitted procurement responsibilities, essential for economy in operation at the top, to extend throughout the Army structure into supply procedures at the bottom, to which the ultimate user must conform.

A Solution

If, then, these basic deficiencies have arisen because of a departure from traditional missions and concepts, let us reconsider the basic mission—apart from the distracting requirement for single central procurement for each and every item. Let us incorporate, as a point of departure, a central procurement service

to procure against the consolidated demands of the service users, with its functions restricted to the sole responsibility for procurement against approved demands. Within the technical services let us revert back to basic and fundamental traditions. Let the ordnance officer determine requirements for and supply to the field user his weapons; the quartermaster determine requirements for and supply all else; the engineer officer construct; the signal officer communicate; the transportation officer transport; the medical officer medicate; and the chemical officer contaminate. Let the quartermaster and the ordnance officer retain full supply responsibility for the organized units of the Army in accordance with their tabulated and normal requirements; let each technical service retain supply responsibility only to the degree of reporting requirements for and supplying items peculiar and essential to its mission.

What have we gained? Here are our gains:

1. A system which can respond rapidly to the requirements placed on it by the combat forces through focusing supply responsibility throughout all echelons on the ordnance officer for weapons and on the quartermaster for all else.

2. A system which provides prompt response from functional support agencies with control over their operating means.

3. A system which imposes minimum administrative demands upon the user who must only turn to a clearly defined supply source for maintenance or for supply.

4. A system permitting economy in internal operations through flexibility, through volume, and through clearly assigned and unduplicated responsibility.

5. A system making maximum utilization of that which is proved and known and which utilizes to the fullest extent the invaluable experience and training of the personnel of the technical services.

6. A system which provides a check against the fallibility of the procurement authority by providing for the determination of requirements in the technical channels of the true and ultimate user.

The ultimate business of a field commander is to destroy the enemy in combat. By personal foresight and care for his logistical arrangements, he can put them in order before the day of battle and thus free himself to turn his personal attention to the fighting.

But, in a broader sense, all of us still have a lot to learn about conducting oversea wars and supporting dependent allies. Scrutinize all recent historical examples with a most critical eye and you will find that our training of future commanders has not prepared them to cope with their logistic problems as skillfully as they cope with tactical problems; in fact, many of them have displayed ignorance and inadequacy which, if continued, can only result in an indefensible proportion of waste, extravagance, and paralysis.

General Williston B. Palmer

Army Transportation--Zeroing In

Harry A. Jacobs
Office, Chief of Transportation, Department of the Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE Transportation Corps, the youngest of the Army's Technical Services, was established in July 1942. Today—as during World War II—the Corps is supporting United States forces deployed in all parts of the globe.

In the United States, it daily moves thousands of military personnel and multithousands of tons of defense supplies and equipment. In overseas areas, military railroads, trucks, marine craft, amphibious vehicles, and helicopters provide mobility for tactical units and haul supporting ammunition, rations, fuel, and equipment.

Since the Revolutionary War, transportation responsibilities were divided among War Department staff, the Quartermaster Corps, the Corps of Engineers, and the Transportation Services established as wartime expedients. The Quartermaster General, for example, was charged with the movement of personnel and supplies in the United States and the operation of the seagoing Army Transport Service, while the Chief of Engineers exercised jurisdiction over military railways.

During World War I, a predecessor to the Transportation Corps, the Transportation Service, was organized to handle all movement functions except highway transportation. After the war, efforts were made to retain the Transportation Service, but in 1920, its activities again were split between the Quartermaster Corps and the Corps of Engineers and the *status quo* existing before 1917 was maintained.

The outbreak of World War II brought a realignment and consolidation of transportation functions. In April 1941, the Transportation Section in G4 was elevated to branch status to co-ordinate increasing movement activities. A Transportation Division, Services of Supply, established in March 1942, absorbed the duties of the G4 Transportation Branch, as well as most of the transportation activities under Quartermaster jurisdiction. The Transportation Division was redesignated "Transportation Service" in April 1942.

The head of the service, designated Chief of Transportation, had little or no supervision over the activities of the transportation officers at Army installations in the United States and possessed no formal relationship with the transportation officers of the overseas commands. No adequate provision had been made for training transportation troop units. To meet these problems, a Transportation Corps was created on 31 July 1942.

It immediately took over the staff and functions of the Transportation Service. Railway operations and maintenance were transferred from the Corps of Engineers in November 1942. With the transfer of highway units from the Quartermaster Corps in July 1946, control of all surface transportation within the Army was at last placed under a single service—the Transportation Corps.

In August 1949, all Army transport ves-

sels were transferred to the newly created Military Sea Transportation Service (MSTS). Port operations, inland waterways equipment as well as harborcraft, remained with the Transportation Corps. In November 1950, the Transportation Corps assumed an important role in Army aviation with the activation of the first Transportation Cargo Helicopter Company. In August 1952, the Department of the Army assigned to the Transportation Corps its responsibilities with respect to research, procurement, supply, and maintenance support of Army aviation.

The Transportation Corps' present organization and activities reflect the dual role of the Chief of Transportation as a staff officer and commander. He is Traffic Manager for the Department of the Army and Commanding General of the Corps.

As a result of the evolution of an "atomic army," present-day military transportation is undergoing far-reaching changes. The Transportation Corps is revising procedures and testing new equipment which must stand up under the conditions of the armed conflicts of tomorrow.

Future warfare will demand maximum mobility of forces. The Transportation Corps must satisfy this need.

The dispersion of tactical units will require parallel deployment of logistic support forces. Conventional ports and congested landing sites are juicy targets. Small, widely separated over-the-beach operations are part of the answer. To this end the Army has developed "packaged ports" and a new group of amphibious carriers consisting of the *Superduck*, the *Drake*, and the *BARC*. For the same reason, it is experimenting with military utilization of aerial tramways, ground conveyor belts, beach lighters, and rough terrain forklifts.

A family of cargo helicopters consisting of 1½-ton, 3-ton, and 5-ton craft is being developed. The use of the versatile helicopter is envisioned as a means for carrying out emergency transportation missions, as well as a primary carrier, when terrain and battlefield conditions prevent the employment of surface media.

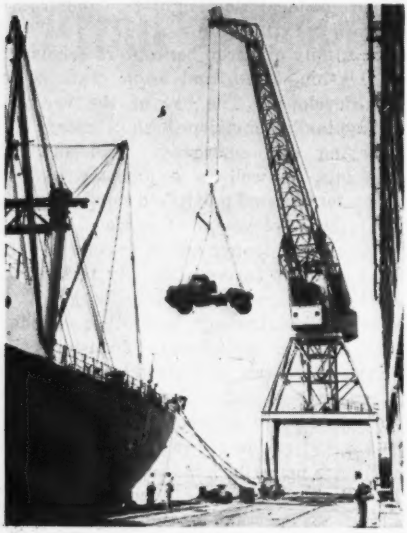
We can no longer afford to consider any land mass as inaccessible. By testing the *Rolligon*, *Marsh Buggy*, *Sno-Buggy*, truck tractors and trailers, and other commercial off-road equipment, Transportation Corps Research and Development engineers hope to establish basic characteristics of suitable military vehicles.

A great stride forward in the effort to minimize material handling is represented by the Roll-on Roll-off principle. Since almost 25 percent of military cargo is wheeled or tracked, the advantage of "rolling" such equipment aboard a vessel at the loading site and "rolling" it off at destination is obvious. It will be very useful at open beach areas where congestion has been created by discharge and transloading activities at the shoreline.

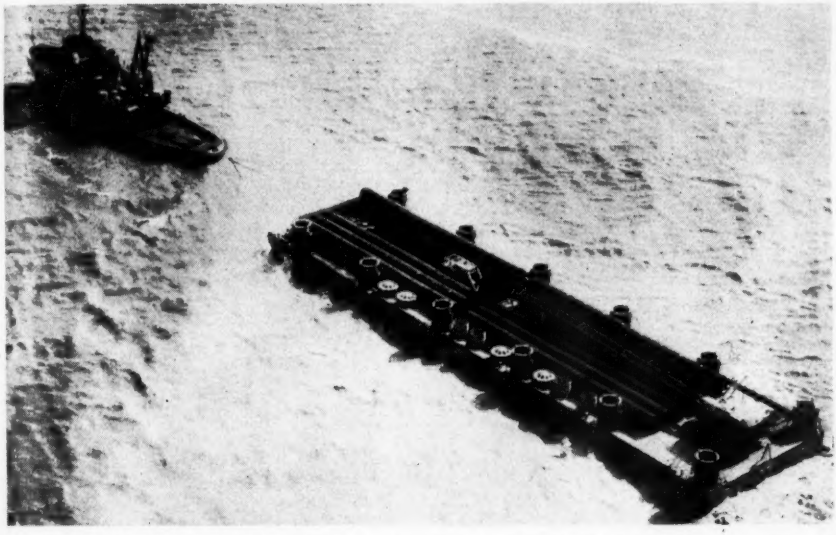
In-transit handling may also be decreased through unitization of cargo. Since approximately 40 percent of military cargo can be fitted into an 8- by 6-foot space, a reusable steel cargo transporter has been developed to meet these specifications.

The development of new transportation equipment and procedures will enable the Army to achieve and maintain mobility of force under any and all conditions now visualized for the age of the "new weapons"

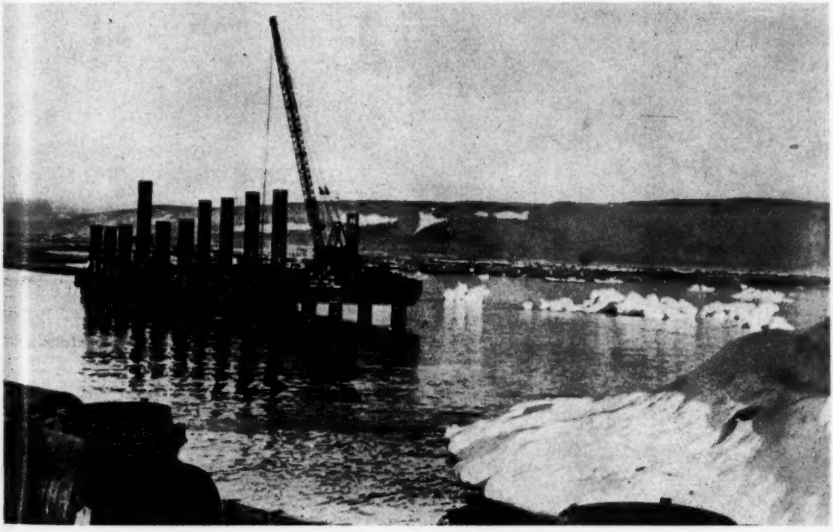
The Transportation Corps expects to continue to provide the Department of the Army with required service at an economical cost. Development of new transportation equipment and procedures will enable the Army to achieve and maintain mobility of force in the "new weapons" age.



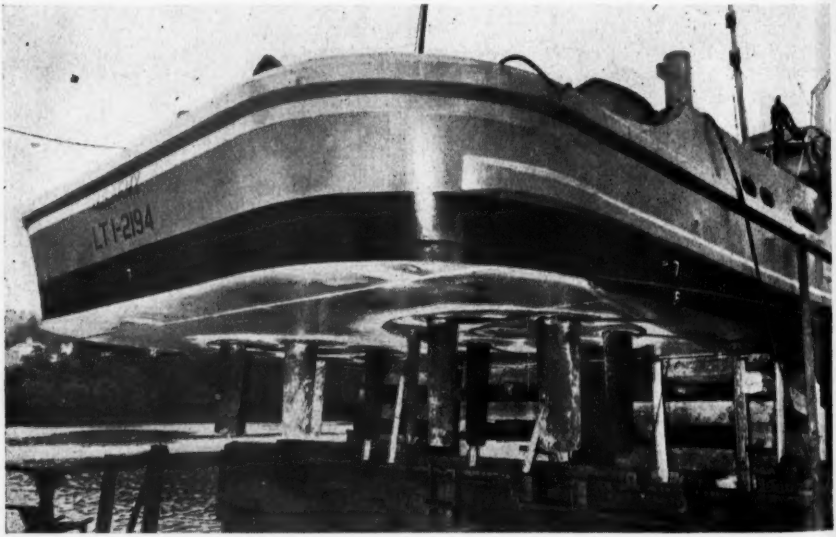
Army-operated port facilities range from modern terminals to primitive landing sites. Above left, first hydraulic level-luffing gantry crane installed in United States. Above right, Army floating crane hoisting Military Railway Service boxcar in Korea. Below, Army detachment in Arctic unloading supplies for Air Force units from *LCMs* and *LCU*.



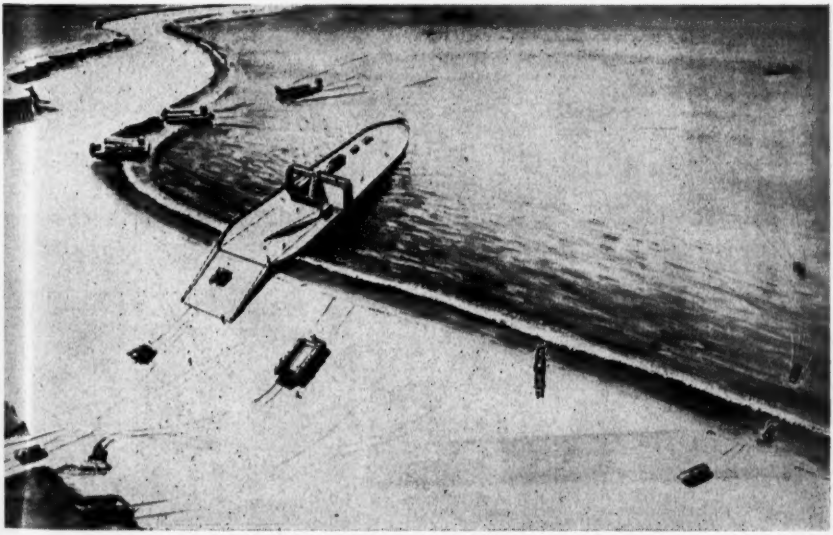
"Packaged ports" can quickly replace destroyed conventional terminals or serve as new pier facilities without large-scale, on-site construction. Above, DeLong Pier, with its readily installed and dismantled main component, can be easily moved to desired locations. Below, "packaged port" in process of erection at Thule, Greenland.



Marine equipment is essential in port operations. Vertical propulsion is also being tested for Roll-on Roll-off beach lighter. Above, the *FS-790,* prototype self-propelled vessel designed for use in shallow waters of port complexes. Below, vertical axis propellers of Army towboat *LT1-2194* provide greater maneuverability than screw type.



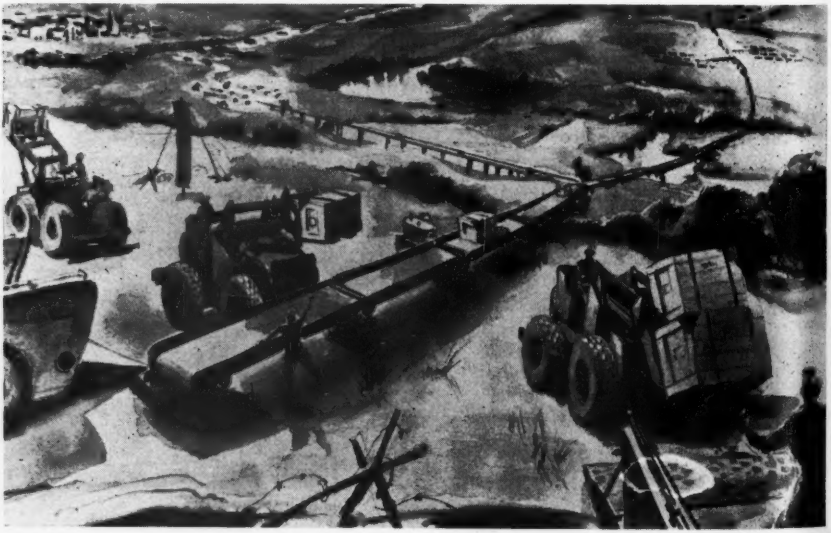
A substantial portion of supplies carried overseas may have to be discharged over undeveloped beaches. Above, lines of men and matériel streaming ashore on Utah Beach in World War II. Below, artist's concept depicting dispersed employment of landing craft, Roll-on Roll-off beach lighter, and amphibian with seagoing ships offshore.

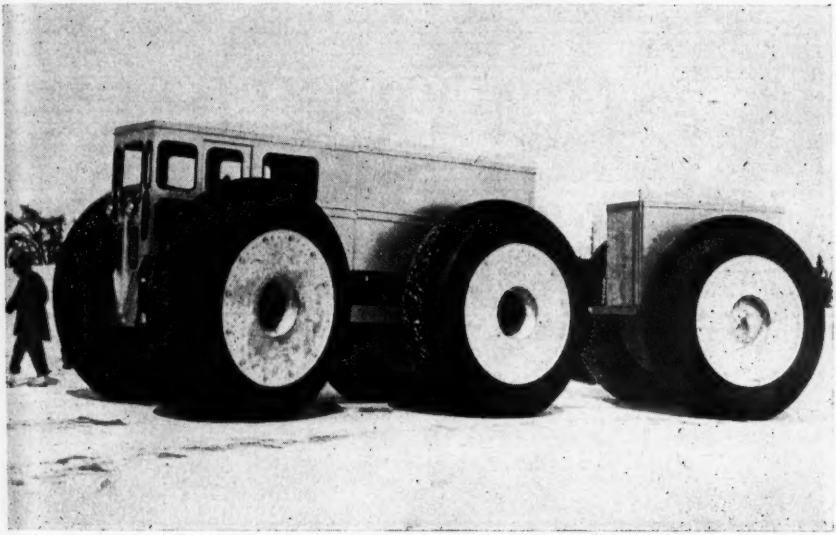


Emphasis on Logistics over the Shore (LOTS) operations requires improved and larger amphibious vehicles. Above, the *Superduck*, successor to the 2½-ton *DUKW*, carries up to 4 tons of cargo. Below, the 60-ton *BARC*, especially designed for heavy lifts. Still in the developmental stage is the intermediate size carrier, the 10-ton *Drake*.

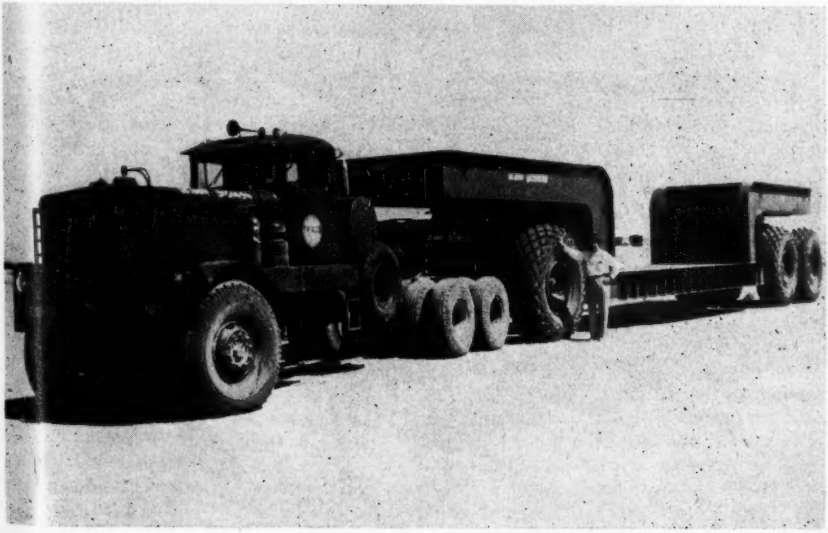
The Army is experimenting with military utilization of aerial tramways, ground conveyor belts, beach lighters, and rough terrain forklifts. Above, are 10-ton "skycars" moving from ship to shore on experimental tramway. Below, 6,000-pound capacity lift model taking cargo from a small landing craft to be loaded on transport trucks.

Mechanization of material handling is furthered by the use of cargo transporters and conveyors. Above, is a reusable steel cargo transporter which carries 9,000 pounds and offers protection against theft, fire, and weather. Below, artist's concept of overland conveyor installed for transporting supplies from beach to inland dumps.

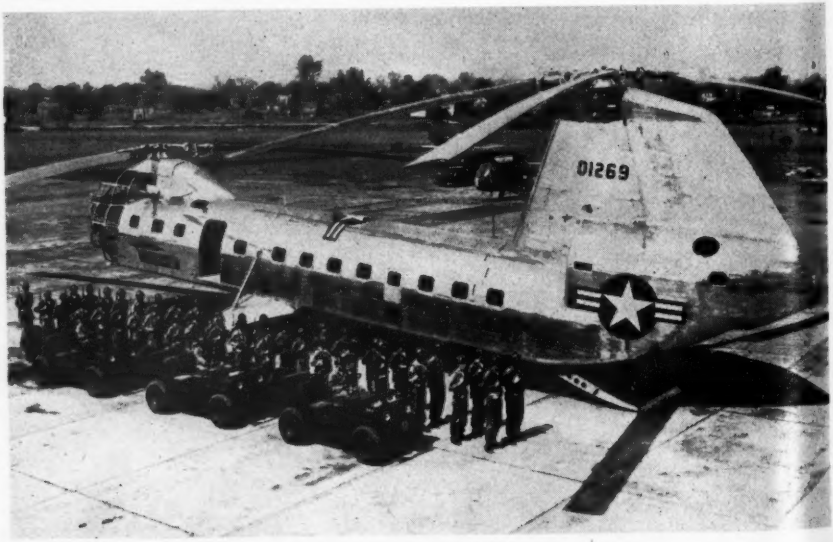




Transportation Corps Research and Development engineers hope to establish basic characteristics of suitable vehicles by testing off-road motor transport equipment. Above, Marsh Buggy (with trailer) travels on huge 10-foot balloon tires. Below, 15-ton tractor pulling 75-ton experimental trailer during tests on desert type terrain.



The use of the versatile helicopter is envisioned as a means for carrying out emergency transportation missions when conditions prevent employment of surface media. Above, the *H-37* carries 3 tons of cargo or 24 soldiers. Below, the experimental *YH-16* designed for transporting 5 tons or 46 men.—All photos from Department of Defense.



MILITARY NOTES AROUND THE WORLD

UNITED STATES

Share Atom Data

In line with the atoms for peace program, the United States plans to provide information on design, construction, and operation of atomic research reactors. Among the countries which have signed agreements with the United States for co-operation in peaceful uses of atomic energy are Turkey, Brazil, Colombia, and Israel. Negotiations are being carried on with Japan, Burma, Indonesia, Thailand, Egypt, and Italy.—News release.

Rescue Boats

A contract to construct nine plastic rescue boats to be used in saving airmen downed in shallow water or swampland has been awarded by the Navy. The 19-foot boats are flat-bottom, blunt-nose swamp gliders. Each boat will use a single air propeller and aircraft type engine mounted in the aftersection. The midsection will be equipped with stretchers to accommodate the injured. Plastic of a type more durable than wood will be used in construction of the boats, which are expected to be used in some areas where submerged logs or other obstacles might be hit. Low maintenance cost is also a feature of the plastic construction.—News release.

Moroccan Base

The fourth and last of the airbases built for the United States Air Force in French Morocco will soon be ready for operation. The Boulhaut Airbase, located 35 miles east of Casablanca, was built at a cost of 23 million dollars. The Moroccan bases are a major link in our country's chain of strategic bases.—News release.

Missile Tracker

Joining telemetering and radar as a means of tracking guided missiles in flight is a double-barreled telescope that can record the flight of a golf ball 8 miles away. When stationed 50 miles apart, two of these Recording Optical Tracking Instruments (ROTI) can pinpoint a missile with a maximum error of only 9 inches in a mile. Accurate radar systems are off about 9 feet in a mile. There are two 16-inch-diameter telescope units on each ROTI, each with different focal lengths. They are mounted one above the other. The long range of the device permits it to cover many types of missile problems from a single stationary vantage point. This method permits complete and accurate information on missile velocity, acceleration, attitude, and spatial position.—News release.

Discontinue Courses

Beginning with the end of the current academic year, the Department of the Army will phase out its Veterinary and Pharmacy Reserve Officers' Training Corps (ROTC) courses. The Army feels that its needs in these fields can be better satisfied through other procurement programs. There will be six veterinary and three pharmacy units affected. Students scheduled to enter their fourth year of work in these fields will be permitted to complete their courses, while all other students will be offered an opportunity to transfer to some other ROTC course being offered at the school they attend. At the present time there is a limited requirement for veterinarians in the Army. As pharmacy officers are usually utilized on a general duty basis within the medical service, it is felt that the General Military Science course offers a better background for these officers.—News release.

Transfer Responsibility

All civil affairs, military government responsibilities, and staff functions formerly performed by the Provost Marshal General of the Army have been transferred to the Army's Office of the Chief of Civil Affairs and Military Government. The Military Government Division of the Office of the Provost Marshal General has been abolished. This transfer centralizes Army supervision of all civil affairs and military government activities within the Office of the Chief of Civil Affairs and Military Government.—News release.

Expand Command

Command of the Thirteenth Air Force has been passed from Far East Air Forces to Pacific Air Force; at the same time, its responsibilities which were largely in the Philippine Islands will be expanded to include the Formosa area. Advance headquarters will be established at Taipei, Formosa.—News release.

Train Pilots

Plans for increasing its supply of pilots through a training program for directly commissioned college graduates have been announced by the Marine Corps. Up until the present time, the Marines have been drawing their fliers from the naval aviation cadet program or the ranks of Marine officers on active duty. Its new aviation officer candidate course will provide an additional source. Applications will be accepted at procurement centers across the country.—News release.

Reserve Training

A special 14-day course of instruction in public information for inactive duty Reserve officers has been authorized by the Bureau of Naval Personnel. The course is designed to meet the needs of Reserve officers in drilling units and will be conducted by staff personnel of the regular Information Officers' Training Course, Naval Training Center, Great Lakes, Illinois. It will provide a basic understanding of the Navy's public relations mission and objectives and an introduction to the mechanics necessary to the effective conduct of the Navy's public and internal information programs. The course is not intended for officer personnel who have had extensive training in information duties.—News release.

Commission Ship

An inshore fire support ship (IFS) the *Carronade*, designed to replace the medium landing ship, rocket (LSMR) which was used during World War II to give close-in support to troops ashore, has been commissioned by the Navy. The ship has been designed to be comfortable to live in without sacrifice of any advanced military or naval architectural requirements. *Carronades* were effective, short-range weapons used by the British Navy in action against ships of the American colonies.—News release.

Plane Guide

A superpower radio station to be located at Camden, New York, will be used by the Air Force to guide its planes. It will cover an area extending from the Azores in the Atlantic to the west coast of the United States and from the Arctic Ocean to the Gulf of Mexico. A pilot anywhere in that area will be able to tune in on the station and check his position. The beam will tell him almost instantaneously what direction he is from Camden and how far away. It is accurate to within about 10 miles.—News release.

Antarctic Study

A Navy task force is expected to take a large expedition to Antarctica in the autumn of 1955, with the group planning to remain there until the spring of 1957. The Navy has called for volunteers among specially qualified naval enlisted personnel. The task force will probably consist of two icebreakers, two cargo ships, and other vessels. The expedition will arrive with the Antarctic summer and during this period will establish bases and conduct mapping and other surveys. After the winter season, the group will go into the interior of the continent in October 1956 to establish three interior stations for scientific observations to be conducted through most of the second summer. Studies will be made of the ionosphere, magnetism, meteorology, geology, the aurora, and other geophysical phenomena. —News release.

Request Planes

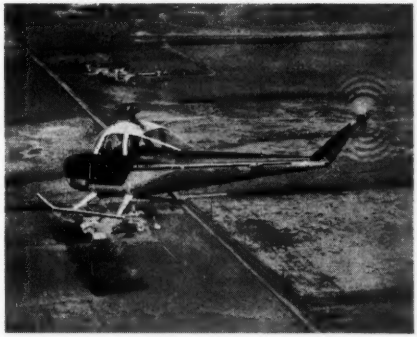
The Air Force has requested an additional sum of 356 million dollars to finance the stepped-up production program of *B-52* intercontinental jet bombers. The Air Force recently ordered a 35 percent increase in the production of the long-range bombers after it was revealed that the Soviets had flown comparable type planes over Moscow.—News release.

Survivor Benefits

Aimed at producing a simpler and fairer system of payments to survivors, a special House committee has proposed an overhaul of military survivor benefits. Under the proposed legislation, all servicemen would be under the regular social security system and the free 10,000-dollar life insurance would go.—News release.

Speedy Helicopter

The latest entry in the helicopter field is the *CH-1* with ability to hover over 11,000 feet, a maximum gross weight of 3,000 pounds, and speeds over 120 miles an hour. It is an all-metal plane with a single main lifting rotor and a conventional tail rotor. The engine delivers a net 260 horsepower to the transmission. With a complement of two people, the aircraft is capable of hovering at altitudes in excess of 15,000 feet. With the addition of 400 pounds, it can hover at 11,000 feet. Its 122



***CH-1* is latest to join helicopter field.**

miles an hour at sea level speed gives it the highest top speed approved for helicopters. The plane uses only three gears in the main transmission and two in the tail rotor assembly, thus offering greater service with less maintenance. The supercharged engine is located in the forward fuselage, giving greater cargo and passenger space near the center of gravity.—News release.

Reinforcement Plan

The new Emergency Reinforcement Plan of the Army, whereby officer and enlisted personnel released from active duty with 8-year obligations are designated for specific assignments in the event of mobilization, has been initiated in continental United States Army areas. The plan is designed to assure the prompt filling of recall quotas for active duty during early phases of a mobilization, as well as to encourage voluntary participation in National Guard and Army Reserve training programs. Men selected for emergency reinforcement designations will be from among those who are not participating as members of Reserve component units. These reservists will be designated for 3-year periods as reinforcements to active Army units or installations and to National Guard and Army Reserve units located as near their homes as practicable. The reinforcement designation can be terminated by men who enlist in the Regular Army or a National Guard unit, or those who volunteer for assignment to an Army Reserve unit with the objective of full and active participation.—News release.

Reduce Reserves

Approximately 16,500 Inactive Naval Reserve officers who have not participated in Navy training programs for at least 2 years will be given honorable discharges effective 1 September 1955. The great majority are in the ranks below lieutenant commander. The reduction is a continuation of the program started last year when 45,000 inactive officers were dropped from Navy rolls. The program is being carried out to bring the peacetime Naval Reserve strength to the numerical limits required by law and planned mobilization needs. According to the announcement, the new reduction will bring the total Naval Reserve officer strength to approximately 225,000. At one time, the Navy carried 313,000 on its rolls.—News release.

Construct Bases

Construction of air defense bases in this country has been stepped up by the Air Force as a result of the Soviet's advances in developing an intercontinental jet bomber. The Air Force has asked for an additional 16 million dollars over its original budget to start enlarging fighter bases.—News release.

Color Radar

Built around a tube originally designed for color television, an experimental color radar set that shows planes and land areas in two colors has been developed. Aircraft appear as bright orange dots traveling over chartreuse-colored land areas. The set is fixed so that planes at high levels appear orange and those at low altitudes, green. The set can also depict friendly and enemy planes in different colors.—*MSTS.*

Folding Hangar

A new type dismountable airplane hangar which permits mass production and prefabrication of hangar parts for permanent or temporary structures has been developed for the Air Force. The proposed structure is comparable in size to two city blocks and can accommodate six *B-36* bombers for maintenance or eight for storage, plus space for a variety of smaller aircraft. The design features a double cantilever and is based on "space frame" construction principles. Structural elements of the web-like system consist of tubular shapes integrated with a new type of connector joint, creating a 3-dimensional, triangulated space frame unit. Prefabricated units can be folded and shipped to the construction site where they can be locked into the final position quickly by unskilled labor. There are no key structural points in the design and parts damaged by explosions could be replaced quickly without disabling the structure while repairs are being made.—News release.

Jet Brakes

A device which permits jet planes to be braked in the air is expected to shorten the landing approach and provide additional safety. Built for the *J-47*, it can be installed on the giant *B-47* bomber. The device deflects the gases before they reach the jet exhaust nozzle, thereby reducing the effective thrust while the engine runs at full power. The pilot can turn off the brake and regain full thrust instantly in an emergency. The newly developed device is lightweight and easy to maintain.—News release.

Civilian Protection

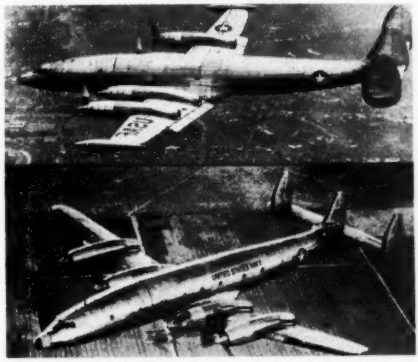
Designed by Army Chemical Corps scientists, a 2-dollar atomic age gas mask for civilians and a "do-it-yourself" kit to build a simple decontaminated air room at home have been developed. As nuclear weapons produce particles that can fall out over a wide area, they pose respiratory and radiation problems beyond the immediate blast and heat effects. Many protective devices for civil defense are available, but the protection of civilians against breathing lethal gases or dusts is a major deficiency it was pointed out. The cheap and easily manufactured civilian mask is made from lightweight plastic materials. In making small shelters for the home, it was established that a special charcoal-containing panelboard, about a quarter of an inch thick, can be built to form an air-tight room. Gases and dust clouds would not be able to enter this room. These panels, however, pass oxygen molecules from the atmosphere into the room, and permit carbon dioxide in the respiratory gases to escape. Efforts will be made, it was reported, to produce a diffusion board that can be sawed and nailed like ordinary construction material. The research was based on the assumption that an attack might use atom or hydrogen bombs as well as weapons using chemical, biological, and radiological elements.—News release.

Rail Cutter

A portable, electric, motor-driven rail cutter which will speed up the construction and rehabilitation of military railroads has been developed by the Corps of Engineers' Research and Development Laboratories. The machine is capable of handling two 39-foot rails, ranging from 70 to 155 pounds per yard, simultaneously, and produces a clean, burn-free surface satisfactory for welding. It can cut a 152-pound per yard rail in less than 45 seconds. It took the engineers about 10 minutes to cut a rail with the reliable hacksaw during World War II and the Korean conflict.—News release.

Turboprop Shape

A Navy and an Air Force *Super Constellation*, which can fly a 16-ton load across the United States in less than 6 hours, show the turboprop shape of air transports. These planes, with a speed of 440 miles an hour, are rated the fastest



Navy and Air Force test turboprop planes.

propeller-driven transports in the world. They are designed for cargo-personnel-evacuation carriers and to increase the military services' store of knowledge about the new field of turboprop flight. The engines combine the turbine power principle with propellers and generate up to 5,700 horsepower.—News release.

USSR

Expand Railroads

Plans to build 1,324 miles of new railroad track across the main stretches of virgin land in southern Siberia and Kazakhstan have been announced by the Soviet Union. More than four-fifths of the mileage will be narrow gauge. The Ministry of Transportation considers narrow-gauge rail lines a most convenient form of transportation, especially in comparison with highway transport in regions of flat terrain such as Kazakhstan. Costs for narrow-gauge lines are said to be only slightly higher than for hard-surface motor roads and considerably cheaper than for broad-gauge railroad lines.—News release.

Hydrogen Plane

Soviet scientists hope to achieve a controlled release of the vast energy of hydrogen fusion for use in space travel according to a Moscow radio broadcast. The report was speculative and did not state that the scientists had achieved the results cited as desirable.—News release.

Open Negotiations

Secret negotiations, expected to last approximately 6 months, have been opened by Japan and the Soviet Union in an effort to obtain a World War II peace treaty. Japan is reported to be seeking an over-all settlement of differences over territorial issues, fishing rights, trade, diplomatic ties, and repatriation of Japanese prisoners of war still held by the Soviets. If the Japanese and Soviets reach an agreement, it is expected to set a pattern for what the Soviets describe as "normalization" of Japan's relations with Communist China as well as with the East European satellites. Japan is seeking the return of the Soviet-occupied Kurile, Habomai, and Shikotan islands north of Japan and support for a seat in the United Nations.—News release.

Unified Command

The Soviet Union and her seven eastern European satellites have established a unified military command to rival NATO with the signing of a 20-year mutual security and friendship treaty. The countries participating in the pact are the Soviet Union, Poland, Czechoslovakia, Romania, Bulgaria, East Germany, Hungary, and Albania. Communist China is sending an observer. Under the terms of World War II peace treaties with Hungary and Romania, the Soviet Union was to withdraw her troops from these countries as soon as they were no longer needed to protect the supply line to Soviet troops in Austria. The unified command would give the Soviets a legal basis to keep their forces in the satellites—said to be 300,000 in Hungary, 300,000 in Romania, and 400,000 in Poland. It is reported that the Soviets have only military observers in the other countries. Actually, it is believed that the satellites and Soviet forces are already under a unified command and that Soviet officers have key advisory positions in many of the other armies. The uniforms of the troops are similar, much of the equipment is standardized, and training and organization of the satellite forces is based on the Soviet model.—News release.

Interplanetary Communications

The creation of a permanent commission for interplanetary communications has been announced by Moscow radio. It was reported that the first task of the new group would be the creation of a laboratory of scientific research in cosmic space. Radio physicists will study processes in the ionosphere to determine the best conditions for setting up radio communications with future spaceships. The laboratory, it was said, could revolve around the earth as a satellite beyond limit of the atmosphere.—*Air Training.*

GREAT BRITAIN

Turboprop Airliner

Soon to take its spot on international routes is the *Britannia*, first giant, turboprop airliner capable of carrying up to 100 passengers between London and New York. The plane, powered by four *Proteus*

Turboprop airliner to enter service soon.

propeller turbine engines, will have a speed of 360 miles an hour for 3,650 miles nonstop. The turboprop is an aircraft powered by engines with a gas stream passing through a rotary turbine which drives a shaft geared to a propeller.—News release.

Helicopter Minesweeper

Being an island depending on seaborne supplies to survive, Great Britain has to pay particular attention to all forms of naval warfare in her defense program. As part of the program, she is now testing a

Helicopter tested for minesweeping role.

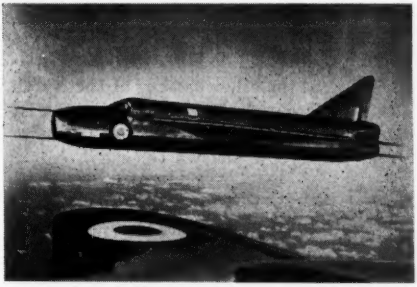
helicopter for minesweeping. The only details released on the craft are that it uses a hook device for sweeping and that the equipment fits under the tail.—News release.

Cheaper Bomb

A new hydrogen bomb which incorporates revolutionary developments avoiding the use of heavy water is reportedly being built by Great Britain. It is expected that this dry bomb, which is cheaper than other hydrogen bombs, will probably be tested on an island site in the Pacific or Indian Oceans. It is reported that the new bomb will be capable of producing blasts with the power of several million tons of TNT. —*Air Training.*

Test Interceptor

The *P-1*, the first British plane to exceed the speed of sound in level flight, is undergoing a stepped-up testing program.



Stepped-up tests for supersonic fighter.

To aid in this program, the Ministry of Supply has ordered 20 preproduction models of the interceptor fighter so that different tests can be carried on at the same time. The plane has been flying for approximately 1 year.—News release.

Strategic Reserve

For the first time in 10 years, Great Britain has gathered the equivalent of more than two combat divisions in the British Isles as a strategic reserve. This is possible because of the evacuation of troops from Egypt. The plan is to airlift troops to prepared supply and weapons depots abroad in the event of an emergency.—News release.

WEST GERMANY

Civil Defense Plan

A civil defense plan calling for air raid shelters in all new buildings in towns of more than 10,000 population and costing 285.6 million dollars has been announced by the West German Government. Under the 3-year plan, public air raid shelters used in World War II will be restored as far as possible. Many of these were destroyed by the Western Powers at the beginning of the German Occupation. Other measures under the plan call for an air raid warning system and a voluntary aid organization of 230,000 members which would handle fire, ambulance, and rescue services.—News release.

Joins NATO

The black, red, and gold flag of the West German Federal Republic will fly alongside those of the other nations of the North Atlantic Treaty Organization as that country officially became the fifteenth member of the group.—News release.

Armed Forces Preparation

The West German Government is preparing legislation which will be the foundation for the future German Armed Forces of 500,000 men. One bill presented recently would authorize the Government to start recruiting officers and men immediately. Officials said that about 130,000 volunteers, mostly former Wehrmacht officers and noncommissioned officers, had already registered. Plans call for the commander in chief to be a civilian, either the Federal President or Chancellor. Top commanders of the military forces have been named already. Other military bills pending provide for emergency requisitioning of civilian property and resources; maneuver rights and security measures; and the holding of civilian jobs for volunteers during their probationary period. A law on the conditions of service and pay is being studied.—News release.

CANADA

Radar-Proof Paint

A paint which it is claimed can absorb radar beams and not reflect them back to their source is said to have been developed by Canadian scientists.—*Air Training.*

Atom Powerplant

Canada's first atomic powerplant will be built on the banks of the Ottawa River, 120 miles northwest of Ottawa. It will be completed in 1958.—News release.

POLAND

Barter Pact

In a recently signed barter trade pact, Poland will import iron ore, machinery, steel, paints, varnishes, and chemical articles from Sweden and export coal, foundry products, chemicals, and textiles. —News release.

SOUTH KOREA

Bar Travel

Youths of draft age between 20 and 24 have been barred from leaving the country. Students eligible for the draft, except for prospective engineers and doctors, were prohibited from going abroad to study previously.—News release.

INDIA

Establish Bureau

A Ministry of Iron and Steel has been established recently and will be in charge of all state-owned enterprises for production of iron and steel and Government-owned foundries. It was pointed out that the announcement did not envisage nationalization of the existing private steel enterprises in the country. The present steel production, estimated at a little more than 1 million tons, is not sufficient to meet expanding demands. The Government's objective is to increase the production of finished steel to about 5 million tons by the end of the second 5-year plan which begins next April.—News release.

FRANCE

'SS 10' Missile

The cable controlled air-to-air and air-to-ground guided missile, *SS 10*, (MILITARY REVIEW, Apr 1955, p 70) is reported to have attracted the attention of allied leaders. The missile can be used for a variety of missions and its operation

Versatile guided missile interests allies.

does not require any special knowledge or training. The missile consists of a streamlined main structure and four cruciform fins to give a rotation movement and stabilize the flight. The weapon may be released from the ground, truck, or aircraft. —News release.

Shift Division

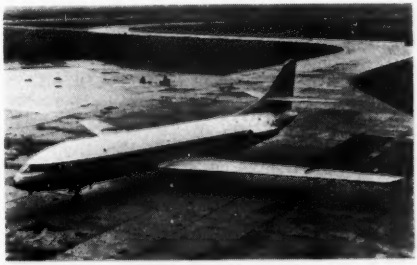
France announced that she is sending to Algeria a division now under command of NATO. It was explained that France's obligation to that organization would not be permitted to interfere with re-establishment of order by military force in Algeria. The division to be sent to North Africa is presumably stationed in West Germany. There are at the present time in West Germany five United States divisions, four British divisions, and the equivalent of four French divisions. There are also other British, American, and Canadian units equivalent to more than a division. Last year about two light divisions were moved to Tunisia by the French.—News release.

Familiarization Program

The company which produces ejection seats for French Air Force planes has developed special ramps for the purpose of familiarizing flying personnel with the operation of automatic parachuting devices. These ramps offer a method of simulating, without the slightest risk, ejections which reproduce faithfully the conditions experienced when bailing out. The system permits pilots to arrive at a degree of automatism in the ejection process and also permits carrying out examinations and medico-physiological tests of the flying personnel immediately after ejection. The ramps are about 40 feet high.—News release.

Transport Ready

The twin-jet medium-range transport prototype, *Caravelle* (MILITARY REVIEW, Jul 1955, p 71), is presently undergoing ground tests consisting of weighing, engine runup, and taxiing tests. The plane will carry 70 passengers at a speed of 480 miles an hour. It will be fitted with its own set of batteries, thus eliminating the services of ground equipment. Stairs



Transport with jets in rear begins tests.

will form an integral part of the passenger door. A tail parachute will be used to reduce the landing run distance. The jet engines are placed at the rear of the fuselage in order to improve the comfort of the passengers and increase the aircraft's safety factor.—News release.

TURKEY

Develop Region

The exposed Black Sea frontier of Turkey is developing the economic and military strength to regain the position it enjoyed under the ancient Greeks. Samsun is a pivot of the new air-sea defense system being constructed on the southern shores of the Black Sea. The system includes radar stations, guided missile launching sites, naval bases, airfields, and pipelines financed under NATO infrastructure program. A large mechanized harbor is being built at Samsun and an all-weather highway to Ankara is also being constructed. The harbor, to be finished in 1958, will handle 1.5 million tons of cargo annually. Similar changes are taking place at other ports along the Black Sea. At Trebizond there is a modern harbor and Sinop is flourishing. A NATO naval base is under construction at Amasra.—News release.

Construction

In addition to the 322 bridges, totaling 60,107 feet in length, already in the process of construction in different parts of Turkey, contracts have been awarded to build an additional 131 bridges, totaling 12,730 feet in length.—News release.

COMMUNIST CHINA

Drought Hits

Authorities have been forced to mobilize Army officers and men to assist peasants as the worst drought in 90 years struck Kwangtung Province. It was reported that work was suspended in two-thirds of the total producing acreage because of the pests and lack of water. The west and extreme southern areas are the worst affected. In the cities of Chaoan, Kityang, and Tenghai efforts are being made to dam the Han River and divert water to the fields. People are being sent from Canton to the countryside.—News release.

AUSTRALIA

Civil Defense School

For the purpose of training key personnel for a civil defense organization, a civil defense school, the first in the country, is to be established soon at Macedon. The school staff will consist principally of officers from Australia's defense and civil services who have already been trained overseas as instructors in civil defense.—News release.

Nickel Deposits

The country is preparing for large-scale development of its recently discovered rich nickel deposits, located mainly in the remote and lonely wastes which lie in the arid northwestern corner of South Australia. Nickel deposits in the area to be worked are said to extend over an area of about 4,000 square miles. Plans call for the equipment to be obtained from Canada and the United States. It was reported that only the Soviet Union, South Africa, and Canada had nickel fields comparable to those lying dormant in South Australia.—News release.

NEW ZEALAND

Polar Role

New Zealand, which claims a sector of the Antarctic covering 175,000 square miles, will now take a more active interest in the sector with the consent by the Government to share in an expedition to the area. Although the country has claimed to administer the area since 1923, no Government official has been there nor have any bases been established. In attempting to get New Zealand to take an interest in the area, scientists have pointed to the major influence of the Antarctic on the country's weather, possible mineral wealth, and the great strategic importance of safeguarding the southern approaches. New Zealand will work with Great Britain and organize the terminal base for the expedition.—News release.

FOREIGN MILITARY DIGESTS

The Crisis of Antitank Defense in Defense

Translated and digested by the MILITARY REVIEW from an article by former Colonel Hermann Oemichen in "Wehrwissenschaftliche Rundschau" (Germany) January and March 1954.

THE German antitank defense experiences during World War II merit consideration not *although*, but *because* Germany lost the war. It is not meant by this to imply that we lost the war because of failure of our antitank defense. Our antitank defense was insufficient, but the decisive reasons for our military defeat were many and important—antitank defense was only one stone in this mosaic. Our experiences are of especial importance, however, because the problem of antitank defense is not a typical problem of the victor—of the party of superior military might—but, because of its very nature, a problem of the weaker party which has been forced onto the defensive.

To anyone who, on the basis of his own experiences, feels that the judgment rendered in this study concerning antitank defense is too severe, we acknowledge that all that is said and evaluated was seen by the eyes of an antitank defense man. A different point of view can result in a different judgment. For example, a tankman who attains his attack objective only at the cost of heavy losses, will speak of an outstanding antitank defense. The same attack may, however, mean a complete failure for the antitank defense man when, in spite of knocking out a large number of tanks, he has not been able to prevent his own unit or the troop unit entrusted to him for protection from being overrun and wiped out by the tank attack.

The Problem

There is no doubt of the fact that everyone is aware of the importance of the problem of antitank defense in modern warfare. There also is no doubt of the fact that in recent decades the dominating interest of all military powers has not been in the direction of antitank defense, but in the direction of the weapon of attack—the tank. The neglect of this important aspect of defense has led to a serious crisis in antitank defense.

In the rather unhappy history of the development of antitank defense there has been but one noteworthy exception so far: the organization of a strong antitank defense unit during the German rearmament movement in 1934. This antitank defense unit, which was organized prior to the development of the German armored arm, was outstanding, both in regard to organization and armament,

based on the standards existing at that time.

If, however, we sum up, objectively and critically, the experiences of World War II, we cannot but perceive that antitank defense was a failure, both with us and our adversaries.

No doubt, if we take the position that "the best parry is a blow" and "the best means for use against the tank is the tank itself," we immediately rid ourselves of all worry concerning the problem of antitank defense with this seducingly simple and apparent claim. That the tank is the *best* means cannot be denied—at least in the face of the present crisis in antitank defense. It is another question, however, whether it is the *correct* means in all cases. In all offensive combat it is, indeed, the only thinkable weapon for *attacking* an enemy who is strong in point of tanks. In defensive combat, however, a degrading of the tank to missions of antitank defense would be a dissipation of one's most valuable combat power. We shall have to look into this matter still more thoroughly.

Characteristic of the underestimation of the problem of antitank defense is the fact that military writings, thus far, have scarcely concerned themselves seriously with this subject. It is not that the problems of antitank defense are never mentioned for they are brought up often enough.

The great fighters of the armored arm seldom fail to dedicate a chapter in their more comprehensive works to the subject of antitank defense. It goes without saying, however, that the advocates of a given idea are unwilling to dilute the persuasiveness of their arguments with the difficulties pointed out in them by their opponents. This would be a poor pleading of their case. The tank experts, therefore, usually content themselves with the factual statement that an antitank defense of such and such a type exists.

Moreover, the subject of antitank defense as dealt with in these military writings is usually limited to certain technical or tactical details or to summary analyses with no attempts being made to get at the heart of the matter.

Since General von Eimannsberger of Austria dealt with this problem several decades ago in a thoroughgoing manner in his book, *Der Kampfwagenkrieg (Tank Warfare)*, hardly another work has appeared that could lay claim to a scientific treatment of the subject.

A notable exception is constituted solely by Swiss military writings which, with great conscientiousness—although within the limited framework of the area with which they are concerned—occupy themselves with antitank defense as the central problem of Swiss national defense.

If the present article achieves no other result than that of giving impetus to a more thoroughgoing discussion of the problems of antitank defense, thus filling this blank space in military writings, a step forward will have been taken.

Antitank Defense

1. *The defensive character of the problem of antitank defense.*

The character of the problem of antitank defense—regardless of how much movement and spirit we seek to instill into the individual antitank defense measures—is, and will continue to be, passive—defensive. The final objective of antitank defense is to eliminate the tank—the offensive weapon of a war of movement—from combat action.

Since, however, no belligerent party dares hope to be able to operate offensively everywhere and at all times, even armies that are powerful from the point of view of armored means will still find themselves in situations where they will be obliged to defend extended sectors of the front. Every belligerent is forced, cost him what it may, to protect his war potential centers from the attacks of enemy tank formations, since the increased

vulnerability of highly developed modern technique no longer permits a mutual war of movement after the style of the past centuries.

We must, therefore, guard against assigning too little importance to defensive thinking. We must guard against a repetition of the same tragedy in antitank defense that we experienced in World War II: during the successful phases, concern for antitank defense seemed superfluous to the victor. Forced into the defensive, the weaker force could have made good use of a powerful antitank defense. It was too late then to make up for what had been neglected.

That defensive modes of thinking, in view of the dynamic nature of the soldier, find less favor than offensive still does not explain the persistent neglect of antitank defense by *all* powers. There have been, and still are, other problems of warfare which also possess a purely defensive character, but which, nevertheless, have been attacked with incomparably greater and more tenacious energy and solved, as for example, the problems of air and submarine defense. That this lethargy still continues unchanged today is seen in the military press where there are frequent, naive, and foolish commendations of new, but tactically useless, antitank weapons; and by the tenor of the postwar command regulations in which the word *antitank* is partly dismissed with a general expression and partly omitted entirely.

2. *The solution of the problems of antitank defense is conditioned by enemy tanks.*

It is in harmony with the fundamentally defensive and passive character of antitank defense that the tanks of the enemy condition the solutions rather than one's own desires. The enemy armored arm is the alpha and omega—the jumpoff point for the answering of every question relative to antitank defense.

No matter from what side we attack the problem of antitank defense, all attempts at a solution will never get beyond the stage of fruitless speculations without an unimpeachable knowledge of the enemy's armored arm. If we wish to push the development of the antitank defense weapons, we must be accurately informed concerning the technical details of the enemy's tank types, especially regarding the strength and type of their armor.

If we wish to come to decisions concerning organizational measures, we must be acquainted with the strength and organization of the enemy tank formations. Our tactical antitank defense means are based on the picture we gain of the enemy's modes of tank employment—and on nothing else.

3. *The protective duty of antitank defense.*

Defendere signifies not only to "ward off" or "to defend one's self," but also "to defend something," or " to protect." This idea of protection in connection with antitank defense presents additional and exceptionally difficult problems to ordnance engineering. David's sling may suffice, as long as he is free to exploit all natural advantages, in the face of lumbering, armored Goliath, but it no longer suffices when he is bound to a certain spot in order to protect his flock. Even small, armor-piercing weapons may engage in battle with enemy tanks when they are free to make skillful use of every terrain advantage. The mission of blocking all tank attacks on the infantry has, however, been an unsolvable problem for existing antitank weapons. Only one's own tanks were capable of performing this mission.

4. *Tank versus tank for tactical defense.*

This would seem to bring us back to our original proposition—is the tank the correct weapon for use against tanks? This must be unequivocally denied if we have reference to tactical defense means.

If one of the belligerents, through lack of other dependable antitank defense

weapons, is able to protect his infantry from tanks only by the use of tanks, he will, of necessity—since, of course, he can leave no unit or threatened sector without protection—be obliged, largely, to decentralize his armored forces.

An aggressor, on the contrary, with a good all-arms antitank defense, could concentrate his armored units whenever, wherever, and however he desired. In such a case, the defender would generally be weaker locally, even when the total strength of his armored arm was greater than that of his adversary.

5. *Antitank defense must be "cheap."*

Because of the fact that antitank defense is *only* a passively defensive problem, one's own tanks are too costly a means to be *used* in antitank defense measures. The problem of antitank defense must not be solved at the cost of a weapon suited for obtaining the decision and victory.

Antitank defense weapons, equipment, and means must be so light and cheap as to make their mass manufacture possible without deleterious burdening of the war production potential. They must be capable of being employed in mass by all arms without weakening the combat power of these arms. In other words, we desire an antitank defense which will make it possible for us, with an initial outlay of but a few thousand dollars, to put a tank worth several hundred thousand dollars out of action. This is a commercialized but graphic picture of the antitank defense problem.

6. *The danger of obsolescence.*

All antitank defense means that are essentially weapons are exposed, to a high degree, to *the danger of becoming obsolete.* A single decisive advance in the development of the armored arm can suddenly bring our entire antitank defense equipment down to the status of scrap metal. Because of this, we again have the requirement that this equipment must be "cheap" so that it can be quickly replaced with new. Even this makes it costly enough.

Technical factors are by no means the only ones capable of bringing about obsolescence. This can also result automatically from changes in tactical or organizational methods. The antitank defense man must constantly check to see whether his thinking, his planning, and his procedures have not already been outmoded by the march of events.

7. *Is antitank defense a revolutionary problem?*

The reply to the question of whether the crisis in antitank defense cannot be overcome by means of natural development or whether revolutionary measures are needed for it is contingent upon the importance we ascribe to the armored weapon in past and future warfare.

Are we convinced that it was the tank to which we were indebted in World War II for the triumph of the offensive over the defensive, and as the means for overcoming the effects of machinegun fire and the barrage of concentrated artillery? Do we see in the tank the decisive means for so accelerating the development of our own farflung operations, that every defensive concept of the defenders was frustrated before it could even be put into operation?

However this may be, we must warn against the idea that the importance of the armored weapon has already reached —or perhaps passed—its zenith. To be sure, with respect to size and weight, the tank has possibly reached the limit of tactical usefulness. It is certain, however, that its capabilities from the standpoint of armament and movement can be increased still further.

However, although we may not be inclined to believe in further qualitative advances on the part of the armored arm, we must, nevertheless, take quantities into account in the future that are capable of

bringing to nought all our previous ideas. We Germans began the Soviet campaign in 1941 with only 3,500 tanks, but with them reached the gates of Moscow. If we increase these figures tenfold, or more—and that, unfortunately, is no Utopian dream in view of the production figures of certain powers—the conviction forces itself upon us that the role of the tank in a future war can only be revolutionary. For that reason, we also ask *revolutionary antitank defense means.*

By this we do not mean any revolutionary technical innovations or wonder weapons of the future. If we possessed any such means or could count on them in the foreseeable future, an end would soon be made of the action of the tank and everything would, perhaps, be as it was previously. As long, however, as the tank dominates the field, it will continue to dictate the new laws or, at least, the tactical forms of offensive warfare. This means, therefore, that the tactical forms of defense must be governed largely by the possibilities of antitank defense. *The problem of defense thus becomes simply the problem of antitank defense.*

Last but not least, the problem of antitank defense is a psychological problem, for the effects of the tank on morale are often greater than the effects of the tank's weapons alone. Although the direct fire of the tank, with its large caliber, flat trajectory cannon, is one of the most unpleasant of combat phenomena, it is not so much the fire as the movement. It is the seemingly irresistible advance of the armored formations which produces so overwhelming an effect and which, like a powder train, is able to produce panic in adjoining troop units or forces to the rear. Only when we succeed in overcoming our instinctive terror in the face of the armored machine, does the ensemble of our antitank defense means acquire the effectiveness we hope for and expect that it will achieve.

An effort to eliminate the effects of tank psychoses by means of systematic and practical training is, therefore, by no means the least important proposal we have to offer within the framework of antitank defense. From the psychological point of view, a "moral inurement to tanks" must not be based on oral or printed "information" intended to present the tank and its capabilities in their true light, no matter how skillfully this is done. It must be based, however, on systematic acclamation of the soldier to the tank by personal experience. The extent to which acclamation to a particular thing is able to "steel" the nerves in the face of actual or imagined danger is clearly shown in the training of the engineer combat forces. The average combat engineer, born no fainter or stronger hearted than any other recruit, through constant working with high explosives not only becomes insensitive to acoustic shock but also unusually indifferent to all danger.

Practical training such as this must be extended to all soldiers. By *all* soldiers is to be understood leaders or commanders of all grades, even among the highest service grades. As experience has shown, tanks progress all the way to command posts in a breakthrough, and when command personnel are faced with a threat to themselves, it may be attended by even more disastrous results than a tank attack on an individual troop unit.

All Services Involved

We see from the foregoing that antitank defense cannot be the task of a special unit, but is a problem for all arms and branches of the service and not only those of the Army but also of the Air Force and, to a limited extent, even the Navy where, in the framework of coastal defense missions, it is forced to ward off armored landing craft.

It is necessary, therefore, to centralize the entire problem under one organization, and not entrust it to a multiplicity of

cooks—the one here, the other there—no matter how talented they may be. Only in this way will the problem of antitank defense be accorded scientifically systematic study which will continue to be pursued with the necessary vigor on the basis of pertinent planning, new developments, and production capacities.

The central organization for this defense would in all cases have to be at a sufficiently *high level* to be able to put into operation the justifiable requirements of antitank defense in the face of the existing military hierarchy and carry them out with the necessary energy even when they conflict with the justifiable requirements of other arms and other command principles.

The word *conflict* as used in this connection must not be misinterpreted. A central organization for the all-arms antitank defense is not required for the purpose of emancipation, but of co-ordination. The antitank defense man must not see in the "guarding of his own arm's interests" the fulfillment of his mission but, through the closest practical collaboration with all arms, he must seek an antitank defense solution that is acceptable to all. He must no more base his proposals of an organizational and tactical nature for antitank defense on an overestimate of armored threat than make excessive demands on the nation's war potential in the technical field for antitank defense equipment. When he is convinced, however, that this threat is not being recognized, then the antitank defense man must attempt, with all the force at his command, to win acceptance for his idea.

The aim of the following dissertation is to sketch the field of the mission of the all-arms antitank defense man in more detail. At the same time, it is not the intention of this study to propose a complete, cut-and-dried solution, for, in the nature of the problem, this simply cannot be done. The purpose of this dissertation is, rather, to give suggestions as to how, on the basis of the experiences of World War II, we may seek the solution of the problem of antitank defense.

Enemy's Armored Arm

We have already stressed the fact, at the beginning of this article, that knowledge of the enemy's armored arm forms the basis of all of one's own antitank defense measures.

1. *The analysis of the enemy's armored arm.*

It is the task of the antitank defense man to make a clear analysis of the enemy's armored arm by means of a conscientious sifting and weighing of all known data relative to the enemy's tanks, probability of accuracy of the same, and their significance, in order to be able to give the higher command a suitable basis for its operational plan; to be able to propose principles of employment and command for the antitank defense measures of the friendly forces; to be able to establish a suitable antitank defense program from the point of view of armament and organization; and in order to be able to provide the unit with worthwhile knowledge concerning the enemy's tanks.

In the evaluation of reports concerning the enemy's armored arm, a special place must be conceded to the all-arms antitank defense man, as, otherwise, every agency which has to contend with questions of antitank defense develops a different view which experience has shown leads to a dangerous confusion of ideas and conclusions.

2. *The elimination of ideas based on one's own armored arm.*

In his analysis of the enemy's armored arm, the antitank defense man must rid himself of all influence resulting from his own dominant opinions concerning tanks and tank employment. What the *enemy* does and presumably will do is decisive—not what *we* have and would do. This

warning hint is just as important as it may appear banal. There is a red thread running through the history of the development of antitank defense, a succession of errors, all of which are based on the natural human impulse to always seek for a thing behind bushes where one himself has hidden or would like to hide.

3. *The changeability of the analysis of the enemy's armored arm.*

Furthermore, the antitank defense man must take into account in all his planning the fact that the picture that he has gained for himself is by no means firm. He must constantly be checking to see whether it is not in need of a little touching up or whether, perhaps, there is need for painting a new one. This applies, likewise, to everything that is said in this study.

The development of the armored arm by the enemy no more stands still than does the development of one's own antitank defense. Every change in the ratio of armored arm and antitank defense may give rise to an entirely new situation. It would be a false policy to act contrarily to this obvious truth and for reasons connected with organization or training to strive to attain a condition of sound *stability.* Rather, the antitank defense man must make every effort to see to it that his antitank defense harmonizes with the actual situation.

4. *Organizational hints.*

The antitank defense man may receive valuable hints for the organizational needs of his own antitank defense from the organizational form of the enemy's armored units. This will depend on whether the major part of the enemy's tanks are organized as large units, or form an organic part of his infantry divisions.

5. *Varying armored threat in point of time and place.*

The following experiences speak in favor of an army antitank defense.

During World War II, the armored threat presented itself with completely different forms at different times and in different places. In addition to the sectors of the front which were repeatedly forced to withstand heavy attacks by massed armored formations, there were sectors where for months, and in some cases years, scarcely a single contact with enemy tanks occurred. There were even theaters in which not a single tank was seen from the first to the last day.

Since antitank defense by antitank defense forces incorporated into troop units predominated in the German Army, powerful antitank defense forces were constantly idle on all fronts. Yet, as a rule, the higher commands had nothing, or very little, at their disposal for bolstering their desperately weak antitank defense at focal points of the tank battle.

Whether this typical experience from World War II is likely to apply to the war of the future should be carefully considered by the antitank defense man. It is to be assumed that the growing total of tanks and the increasing incorporations of tanks in infantry divisions will have violent repercussions on future warfare, and that the enemy will have to be counted on to use tanks everywhere and at all times.

6. *Attack methods.*

The type of attack methods to be employed by the enemy basically, such as whether he will attack operationally with large armored formations accompanied by infantry carried on lightly armored vehicles and supported by heavy self-propelled guns, or by infantry following on foot, may be deduced by the antitank defense man from what he knows of the enemy organization and command principles.

7. *The operational employment of armored units.*

We must expect armored formations to be employed operationally when the enemy knows that he is able to conduct blitz operations with a massed concentration of armor and an extended operational

objective on the basis of the following: the strength of his motorized, mechanized, and armored formations; the state of the technical development of his tanks; the technical and organizational readiness of his supply command; the tactical capabilities of his intermediate and lower commands; and the strength of his aviation.

8. *Tank attack with infantry.*

The antitank defense man must expect a tank attack supported by infantry on foot when the attack is directed against a strong enemy who is prepared for defense.

In regard to the academic question as to whether the enemy will attack with infantry or tanks in the lead, the antitank defense man will do well not to draw his conclusions on the basis of the known training principles of his adversary or his practices in training exercises. He should assume, however, as his guiding principle, that his adversary will make use of whatever method is most in harmony with the existing situation.

The stronger and more effective one's own close antitank defense is, of course, the more it may be assumed that the adversary will attack with his tanks in the lead.

9. *The use of tanks as artillery.*

Although the antitank defense man must be prepared to repel a tank attack, he must by no means overlook the fact that the enemy, even without intending to attack with his tanks, as such, is able to make use of them as a form of mobile artillery. Many regard this use as a crime against the sacred principles of the employment of armor.

Combating these tanks, which appear singly or in groups, is exceedingly difficult with antitank weapons for they fire from a safe distance and make skillful use of any cover offered by the terrain to knock out weapons and strong points.

10. *The combat of lightly armored vehicles.*

Finally, the antitank defense man must take into account the fact that antitank defense not only comprises the combat of heavily armored vehicles, but also the combat of lightly armored vehicles of all types such as light reconnaissance tanks, personnel carriers, and ammunition carriers whose appearance on the field of battle must be counted on in the event of a vigorous enemy tank attack. As a rule, these fast and highly maneuverable vehicles cannot be fought with the usual antitank weapons. One must, therefore, be able to fall back on the employment of long-range, fully or semiautomatic weapons using armor-piercing ammunition.

Measures in Defense

We have already stressed the fact of how greatly the tactical and operational planning of the future defense command will be dependent on the existing ratio between the power of the tank and the power of antitank defense.

We further emphasize the fact that the present technical state of antitank weapons is unsatisfactory—so unsatisfactory, in fact, that we must diligently consider whether and to what degree the concepts entertained relative to defense are still of any value for the future.

1. *Antitank defense means of the higher command.*

For antitank defense in the operational framework, the means at the disposal of the higher command are its aviation, as well as its armored units and the army antitank units.

Aviation, thanks to its superior speed, is the only arm that is capable, even in blitz warfare, of still dealing sufficiently timely operational blows on strong enemy armored formations. Still, the massed employment of aviation for antitank combat is contingent upon one's possessing air supremacy as well as dependent on the state of the weather. This uncertainty makes the vigorous participation of aviation in antitank combat an event to be desired but not always dependable.

A sufficiency of operational armored reserves in the hands of the higher command is always the best and the most reliable means for enabling one to meet strong enemy armored formations. For this reason, the main body of one's own tanks should not be dispersed and tied up in tactical antitank defense missions.

Since, of course, one's own tanks as well as the army antitank units usually move at practically the same speed as the enemy's tanks, they cannot prevent the initial success on the part of the massed enemy armor.

The system of "neighborly aid"—help from adjoining units—was shown by the experiences of World War II to be an especially quick and effective emergency measure. By this is meant the reckless gathering together at the focal point of the tank battle all antitank weapons and troops which can be spared from sectors that are not being attacked. In spite of all fundamentally justifiable scruples against any breaking up of units, the particular importance that attaches to antitank defense imperatively demands this systematic "neighborly aid" as one of the most important measures.

2. *Choice of terrain.*

The influence of terrain on tanks and antitank defense is definitely of a tactical nature. Operational considerations will, therefore, be limited virtually to the selection of terrain areas over which the defense will be conducted where the attacker will not be able to make full use of his armored strength and where, in addition, one's own available antitank weapons will have as many advantages as possible in the face of the enemy's armored forces.

An emphatic warning must be sounded, however, against the attempt to draw a conclusion concerning the probable point of main effort of the enemy's armored attack on the basis of a summary estimate of the terrain. During the course of World War II, both of the belligerent parties learned only too well that tanks cannot only be successfully engaged in any terrain but that even decisive armored offensives can be conducted over terrain which, according to peacetime theories, would have been regarded as completely impassable for tanks. The defender, on the other hand, in the complacency of a false sense of security, had neglected his antitank defense.

The belief that any given terrain is impassable to tanks is to be entertained only with the greatest of caution. Even extensively forested terrain or terrain abounding in lakes, marshes, and mountains—even high mountains—immediately lose their qualities as obstacles to tanks which are capable of fighting their way over roads, paths, embankments, through narrow passages, and over mountain passes. Such terrain features can, at best, save the defender from the employment of antitank defense measures from the quantitative, but never from the qualitative, point of view.

There is only one antitank obstacle suited by nature for blocking major tank movements, and this is broad, deep bodies of water.

Tactical Measures

What we demanded with regard to the problem of antitank defense as a whole, also applies in the tactical domain. The antitank defense of all arms is not the task of a special unit but, first of all, that of a general command which, even within the framework of the division, requires centralized regulation by a responsible organization.

Reconnaissance and the planning of all active and passive antitank defense measures which find their expression in the so-called "antitank defense plan," as well as the command and supervision of the weapons of the units brought together for the antitank defense, must be placed in a single hand. In which hand will be considered in more detail in the section

which deals with matters of organization.

1. *The antitank defense plan.*

An antitank defense plan must be far more than a multicolored situation sketch in which the armor-piercing weapons—without regard for terrain covering and other obstacles in the field of fire—are indicated with great neatness together with perfectly circular, optimistically assumed fields of fire making for a self-satisfying feeling of security.

The antitank defense plan is, essentially, the careful planning and harmonizing of all antitank defense measures, of which the most important are exploitation of the terrain; fire plan; passive antitank measures; tank warning, message, and observation services; and alert stage order.

Exploitation of the Terrain

A given terrain not only favors or makes impossible given tactical forms of armored attacks but—and most pertinently in our case—it also favors or makes impossible the employment of given antitank weapons. Thus, for example, the employment of close, antitank combat weapons is almost impossible in open terrain in the winter season when the covering of vegetation has almost disappeared, while dense vegetation in similar terrain in the summer greatly increases the value of close, antitank combat weapons.

Thorough terrain reconnaissance and skillful exploitation of the terrain can, therefore, be of decisive importance in antitank defense.

In the conflict between selecting terrain favorable for antitank defense and that suitable for the tactical interests of other weapons, the greater the threat presented by enemy armor, the greater the possibilities are that the decision will be in favor of antitank defense.

The choice of a terrain tactically favoring antitank defense begins with the choice of the main line of resistance. As a rule, the antitank defense man will desire that this be located on the rear slope of a rise in order that the antitank guns in the forward positions of the main line of resistance may not be recognized and destroyed before the beginning of the attack; and in order that these may take the tanks of the first enemy attack wave under fire by surprise as these tanks cross the crest of the rise without running the risk of these guns being knocked out by other protecting tanks or enemy weapons following at a safe distance in succeeding waves.

When positions are selected behind a ridge and the broad, frontal field of fire is sacrificed, it not only means a reduction of general defense possibilities but also a decided disadvantage for antitank defense for the necessary timely separation of the attacking tanks from the infantry accompanying them is made considerably more difficult.

In the choice of firing positions for the armor-piercing weapons in the depths of the field of combat, essentially the same principles apply: the frontal field of fire of an antitank cannon must not, in principle, extend farther than the effective range of action of the weapon under consideration. In other words, the nature of the terrain should so limit the natural field of fire that the enemy tanks will not be able to put the antitank cannon out of action at a distance at which these guns are still unable to reach the tanks.

Terrain sectors that effectively cause tanks to crowd together in their forward progress should be made into "antitank barriers" through the use of active and passive antitank means. In regard to the use of terrain to cause tanks to concentrate, the ability of tanks to negotiate almost any terrain must not be underestimated.

The fire plan will govern the engagement of all weapons suited for antitank combat —with the exception of close-range firearm type antitank weapons—by type and

capability. Mobile antitank defense weapons, such as mobile antitank cannon and assault guns, are to be included in the fire plan and as time will permit, suitable firing positions found and organized for them.

Never should a single armor-piercing gun be engaged alone. There must always be several antitank cannon capable of superimposing their fire and mutually supporting one another. All unnecessary concentration is to be avoided, however. This last reminder applies especially to the artillery and antitank cannon which are accustomed to firing by batteries from a limited area. It would be equally incorrect to disperse these weapons too widely in the effort to "cover" an entire area in breadth and depth. If certain areas must be slighted in the fire plan because of a scarcity of means, these should not be the areas in which enemy tanks will presumably not appear, but areas in which tanks would do the least tactical harm. The *center of gravity* of antitank defense is, conversely, to be located at the point where an enemy tank attack would be *most keenly felt by the defender* from the tactical point of view. Command posts, inclusive of those of the higher command, are not included in this group. They have other ways of escaping from the threat of enemy armor.

Flanking attacks and attacks on the enemy's rear made possible by frontal cover are to be employed wherever the tactical situation permits. Since, however, this form of engagement is contrary to the normal combat instinct and traditional usage of combat forces, every effort must be made to see to it that it does not remain a dead letter put only on paper.

No less important than that of the armor-piercing weapons is the inclusion of the nonarmor-piercing weapons in the fire plan. For obvious reasons, the enemy tank attack must be deluged with fire from beginning to end by all available weapons, light and heavy, of both direct and indirect fire in order to compel the tanks to close all their ports and slits and to force the infantry to separate itself from the tanks.

Passive Antitank Defense

As already stated, the best of terrain is valueless if not commanded by the weapons of the defender. Therefore, the planning of active as well as passive antitank defense measures must be centralized.

Since terrain favorable for antitank weapon firing positions is easier to find than terrain favorable for antitank obstacles—at least obstacles that require the movement of large quantities of earth, although mines may be laid in practically any terrain—the choice of firing positions will, as a rule, be governed by the courses followed by antitank ditches and the edges of slopes, and not vice versa.

It is an unavoidable necessity to leave passages or crossings open in all continuous obstacles in the depths of one's own field of combat up to the "very last moment," for use by one's own forces. Since any obstacle is only as strong as its weakest point, these passages are critical points in the over-all passive antitank defense system. Careful provision must, therefore, be made in the antitank defense plan for ensuring a timely sealing of these passages in the event of an overly acute armored threat.

A further important measure in the antitank defense plan is the securing of the central command, observation, and signal communication posts, vital to the conduct of operations, by means of passive defense measures or by the selection of a location where the armored threat will be at a minimum.

Tank Warning Service

The usual "tank warning service," as far as this has existed on the front at all, has been inadequate. What is needed is a message and observation network of a relay type reaching far into the depths.

This should be manned by "trained tank observers" and serve not only to give an initial warning of the approach of tanks and to report any penetrations they may make, but also for continuous observation and the instruction of the command relative to the further development of the enemy tank attack.

Further important elements of the tank warning and observation services are air and radio reconnaissance—and a radar antitank reconnaissance—which still requires technical development.

Alert Stage Order

The rapid tempo of an armored attack requires rapid command decisions. The transformation of these decisions into deeds, by means of commands, usually requires more time than is available. It is to be recommended, therefore, that a certain schematic "alert stage order" be incorporated in the antitank defense plan, so that definite measures such as the regrouping and relocation of portions of the artillery and antiaircraft artillery for the defense may be effected by means of key words. A schematization such as this —which is foreign to German tactical concepts—would not, by any means, limit the freedom of the command to make decisions. Rather, it would free it from the necessity, in spite of shortage of time, of having to bind itself with premature, definite decisions for fear of jeopardizing the possibilities of a timely execution of the required measures.

2. *The tactical concept of defense.*

Although we could have suggested a number of other practical ideas for antitank defense in defense, it is difficult for us to suggest a general defense idea that will meet both the requirements of antitank defense and those of general defense at the same time.

Our concept of defense at the beginning of World War II was based on the requirement of annihilating every assailant before he had reached the main line of resistance by the concentrated fire of all weapons.

In order to be able to do this, the main body of all armor-piercing weapons —like sparrows on a telegraph wire—had to be located along the forward edge of the defensive position. Even when a favorable superelevated defense terrain permitted a certain amount of dispersion in depth, this in no way altered the fact that the antitank guns located "farther to the rear" were held out as if on a serving tray and exposed to all of the enemy's fire.

In this connection, we must never fail to bear in mind the fact that the tank turns the natural relationship between attacker and defender upside down. It is the attacking tank which, like an "ambulant field fortification," carries its cover with it—and the faster it moves, the more effective this cover is—while the weapons which are attempting to ward off the tank are obliged to expose themselves when they fire.

The aforementioned compromise proposal with the location of the main line of resistance on the rear slope of a rise has the advantage in that more protection can be given to the leading portions of the infantry in the difficult fight against the tanks breaking into its position. In doing this, the infantry uses not only the light antitank guns belonging to the unit, but also the longer range divisional antitank guns located farther to the rear.

Defense in Depth

If in place of clinging doggedly to an untenable concept we accept the fact that in the present state of antitank defense, a massed tank attack is, at best, halted only in the depths of the main field of combat, the antitank defense plan must provide in advance for a corresponding organization of the antitank defense, making use of all weapons and units.

There is no doubt that even this solution is not "ideal," for it offers the attacker

the opportunity of knocking out the weapons and units of the defender *one at a time* and *one after the other*. After the forward infantry has become the initial sacrifice of the combined attacks of the tanks and their accompanying infantry, the antitank defense of the rear areas, no longer protected by its infantry, is in its turn knocked out, whereupon the most valuable part of the defense, from the standpoint of its matériel, namely, the artillery, is then destroyed in a one-sided battle.

The question of how a unit, which is the victim of an attack by a superior tank formation, should conduct itself with tactical propriety is difficult to answer. The demand that it should permit the enemy tanks to "roll over" it is easily made at the "green-topped table," but is an overdemand in practice that even battle-seasoned troops are seldom capable of reaching. As a rule, this demand is also inconsistent with fact, for the reason that tanks penetrating into a position seldom merely "roll," but—departing from this practice employed in maneuvers and on the practice terrain—work their way forward in co-operation with their accompanying infantry step by step, halting for fire, and thoroughly mopping up in their sector.

The "island tactics" which were often preached during World War II, but seldom practiced, proved equally unsuccessful. According to this tactical procedure, portions of the infantry who were forced from their positions were to make a stand in areas favorable to antitank defense and to organize an all-around defense in conjunction with the antitank gun nests in these places. Although to the very end in the Eastern campaign it was observed that encircled forces fought desperately even in hopeless situations, it must not be overlooked that, although a large *Kessel* with sufficient supply by air is able to hold out for months, only limited resistance —measurable as a rule by hours and, at best, by days—can be expected from small groups of forces left to their own resources. The "island tactics," therefore, are logical only when an immediate clarification of the situation by means of counter-attacks can be counted on from the point of view of command troops.

Mobile Defense

If we are obliged to count, in advance, on an irresistible thrust by massed enemy armor into the depths of our defensive position, the question arises whether it is not more correct to make a virtue of necessity and, instead of fearing the unavoidable initial success of an armored attack and trying desperately to prevent it, to yield terrain voluntarily to it in order to save useless sacrifices of blood and matériel; to gain time for the execution of our own countermeasures; and to strike the armored wedge that has penetrated into our position on its vulnerable flanks.

Such systematic withdrawal movements in the course of a rolling tank attack would make unusually high demands on command and units. Nevertheless, the idea merits thorough consideration, especially if the defender has tanks and mechanized antitank defense units at his disposal.

Although, with our present antitank armament, we are unable to give any satisfactory answer to the question of a practical form of defense against tanks, this certainly does not mean that the problem has no solution. The fact that all the solutions offered are unsatisfactory should stimulate one's sense of responsibility for seeking ceaselessly, with a critical weighing of all interests and in collaboration with other arms, the best possible solution.

Any solution in which technical or tactical weaknesses are to be compensated for by the blood of the infantry forces must be unthinkable to the antitank defense man.

Organizational Measures

The principle that the solution of the technical and tactical problems of antitank defense comes first applies also in the domain of organization. Not until these have been solved can precise organizational proposals be made. In the framework of this study, therefore, we must content ourselves, again, with a few organizational principles of a generally valid nature.

1. *Ammunition Supply.*

While in the case of the artillery battle the quantity of ammunition available is, as a rule, of more importance than the number of guns, the reverse is true in antitank defense where a sufficient number of guns is decisive in the success of the battle. Although the need arises during the tank battle for momentarily heavy expenditures of armor-piercing ammunition, the over-all expenditure of antitank ammunition is relatively light.

The ammunition problem centers mainly around ensuring an adequate ammunition supply during battle. This is not a difficult problem to solve in the case of towed antitank guns in a "fixed" position. This can be done by the storage of ammunition within reach of the firing position, but for guns on self-propelled mounts, special organizational measures are required. Conversely, the limited ammunition supply of the attacking tanks represents a definite weakness in the enemy armored arm.

2. *Weapon Requirements.*

The antitank defense man will not base his requirements in the matter of antitank weapons so much on general organizational considerations as on the following points: What breadth of sector will a given troop unit have to defend normally? How many tanks will an assailant normally engage against such a sector? How many tanks, altogether, does the attacker have at his disposal?

On the basis of the assumption that the useful field of fire of an antitank gun in the average European terrain would be in the neighborhood of 550 yards and that the antitank guns, engaged in pairs, at least, are to be able to combine their flanking fire as well as their fire in depth mutually, the minimum requirement of the combat forces in the frontline—not inclusive of close-range antitank weapons —would be eight antitank guns for each 0.6 mile of front. For the necessary organization in depth of the antitank defense in defense, 3 to 4 times this number of armor-piercing weapons would be needed per 0.6 mile of front.

If, however, we base our calculations on the enemy tanks, we can rationally assume only a "normal" attack, never an "exceptionally heavy attack," if we do not wish to arrive at irrational figures. A unit so equipped with antitank weapons that it would be able, on its own, to repel a major enemy tank attack must be considered as out of the question to begin with. The necessary augmentation in strength, as already stated, can be effected by the rapid bringing up of operational and tactical antitank reserves and recourse to the help of adjoining units.

It is true that all numerical calculations are, to a certain degree, but visionary, especially since a comparison of the combat value of a given antitank weapon with the combat value of an enemy tank is never more than a hypothetical matter. In spite of this, however, the antitank defense man must attempt such a calculation in order to be able to see, to a certain extent, where he stands with his antitank defense.

3. *Creation of Antitank Defense Units.*

The greater the possibilities for the effective shifting of the heavy standard weapons of the infantry, the artillery, and the antiaircraft artillery for use in antitank defense, the more the requirements for special antitank weapons can be reduced.

If the ideal solution could be attained, that is, a multipurpose weapon created that was completely satisfactory both tac-

tically and technically and of such a type that tanks could be combated just as readily with standard weapons as general targets could be combated with antitank weapons, a special unit within the division for antitank combat could be abolished. As long as we do not have this weapon, however, the antitank defense man must insist on the constitution of special antitank units.

4. *Antitank Defense Unit Organization.* Independently of the technical solution —whether a single purpose or a multipurpose weapon—light antitank guns in adequate numbers should form a part of the equipment of the infantry. Just how these should be incorporated—whether by platoons with the heavy weapons company of the battalion or by companies in the regiment—would depend on the principles of organization of the infantry. The antitank defense man is merely interested in knowing that, whatever the case may be, an antitank defense reserve will remain in the hands of the regimental command for use in forming points of main effort.

In addition to this, suitable equipment of noncombatant forces with light antitank guns would be desirable. Carried by the available combat vehicles of these forces, they could serve a triple purpose: the protection of the noncombatant forces against tanks; the reinforcement of the antitank defense in its organization in depth; and an equipment reserve for the fighting unit.

Divisional Antitank Defense

The division of the divisional antitank defense into three companies, as has hitherto been the practice, has proved its worth. Nevertheless, a division into four companies, that is, one more than there are rifle regiments in the division, would be preferable from the tactical point of view and from the point of view of "neighborly aid"—a point by no means of the least importance.

In conformity with their principal mission—that of constituting mobile reserves for the formation of points of main effort —mounting of the heavy antitank guns of the divisional antitank defense on self-propelled mounts would be desirable.

Army Formations

The constitution of sufficiently strong army antitank defense formations—inclusive of corps and army units—as mobile operational and tactical reserves is decisive in the solution of the antitank defense problem. In reply to the further question as to what the ratio should be between the strength of the divisional and army antitank defense, we can only repeat what we have already stated: The more closely the antitank defense man adjusts himself to the picture deduced from the organization of the enemy armored arm, the more correct he is likely to be in his proposals. In the calculation of the necessary army antitank defense formations, he is, in exceptional cases, justified in looking upon his own armored reserves as antitank defense reserves.

In case organizational and technical considerations do not oppose such a choice, caterpillar tread mounts, from the purely tactical point of view, would be preferable for the "reserve platoons" of the infantry antitank defense, for one or two of the units of the divisional antitank defense, and for the corps antitank defense forces. For the antitank defense formations of the superior command, on the other hand, wheeled mounts, because of their greater speed and reliability, would be preferable. In case one is able to indulge in this luxury in the way of equipment, and is so minded, then, of course, in the case of the army formations, truck-borne caterpillar tread mounts on low-slung trailers would be the ideal solution fulfilling both operational and tactical requirements.

We have already spoken of the necessity of a "central organization for the all-

arms antitank defense" on the highest level, and a central command for antitank defense within the division. Corresponding organizations for other command organizations would also be desirable.

The Germans had already created a similar organization in the so-called *Stopak*, that is, "staff officers for antitank combat." In common with many wartime emergency organizations, however, this organization suffered from difficulties in the matter of personnel and materials and, therefore, was not very satisfactory.

Fundamental changes are necessary here. However much we may preach the doctrine of "cheapness" and moderateness in the material equipment of antitank defense, the idea of "cheapness" is out of place in the selection of *Stopak*. On the contrary, a mission whose problems have ramifications in all arms and branches of the service has prime need of general staff treatment. All-arms antitank defense should not only be an important study for future staff officers in the curriculum of staff colleges but, in addition, the command of divisional and army antitank defense units should be exercised by the normal command headquarters composed of both junior and senior general staff officers.

In its details, the suggested composition of the "staff officers for all-weapons antitank defense" is as follows:

1. *On the Divisional Level.*

In the framework of the division, the commander of the divisional antitank defense unit appears to be the proper man for assuming command of the all-arms antitank defense. For peacetime training, this should not only be permissible, but even desirable, since this man would not only be a troop commander but also have far greater responsibility.

In time of war, however, it must be remembered that the antitank defense commander is, above all, the commander of a combat unit and also belongs to this unit and not in the division command post. It would, therefore, be well if, on the more restricted command staff of the division, a junior staff officer were especially entrusted with the all-arms antitank defense to relieve the chief general staff officer. This solution would also be appropriate for the reason that the "antitank defense staff officer" is frequently obliged to intervene in the command of all arms and units. On the other hand, such a solution would in no manner need to interfere with the close co-operation and mutual aid between the staff officer and the antitank defense commander.

2. *Higher Level.*

In the higher command organization, one of the most important missions of the antitank defense staff would be the organization of "neighborly aid."

From the standpoint of organization, the same type as that proposed for the division is recommended. The representative of the *Stopak* in this case would be a commander of corresponding rank of a larger or smaller army antitank defense unit.

The numerous antitank defense formations brought together at the focal point of the tank battle have need of centralized command, but also, in the interests of a sound policy with respect to personnel, an organizational unification of army antitank battalions into regiments and brigades would be desirable.

3. *Central Organization.*

We have already shown the necessity for the existence of such an organization. In reference to the structure of this post, it can only be said that its extensive field of activity cannot permit it to overexpand by the attachment of its own weapons and special units. Since the supreme "all-arms antitank defense man" has only the mission of issuing directives and not the mission of interfering in the organizational affairs of other arms, his occupation with the fields of research of "the

enemy armored arm" and "the technical requirements of weapons" should suffice. The principal field of research, "training, and the principles of employment and command," would be dealt with by an "all-arms antitank defense service school under the direct control of the antitank defense inspector."

On the other hand, a special field of research, "antitank defense," should receive the attention of the service sections of the categories and branches of the armed forces involved, whose representatives should work in close collaboration with the all-arms antitank defense inspector. For all general antitank defense problems arising, a group of experts, either of a permanent nature or convening as cases may arise and constituting an advisory committee for antitank defense, could be formed for seeking the best possible solution by joint effort.

Training Problems

The study of training problems in the field of antitank defense is the principal mission of an all-arms antitank defense inspector. The antitank defense school—at army or combined forces level—is attached to the inspectorate and is directly under its control and will, as a kind of antitank defense academy, co-operate in the task of the inspector, having charge of:

The development of all general and basic regulations for antitank defense and the checking of pertinent sections in the command and training regulations of other arms and branches of the service.

Uniform training in all branches of the service.

Schooling of the staff officers for antitank defense.

Schooling of the instructor personnel in all branches of the service.

Development of practice devices, firing aids, and instructional material for the units.

Testing of new antitank defense weapons and devices in the units.

In detail, the field of activity of the school embraces the following branches of training:

1. *The Preparation of Regulations.*

The school department in charge of the preparation of regulations must see to it that the antitank defense regulations keep abreast of the altering antitank defense situation in spite of the continuous development of enemy tanks and their own defense weapons.

2. *Tank Identification Service.*

In the tank identification service, the task is, on the one hand, to instruct the unit in a clear and graphic manner concerning what it should know in regard to enemy tanks and, on the other, to protect it from all superfluous and confusing information. This last requirement has been much sinned against in the past.

The tank identification service is not merely a theoretical branch of instruction, but must be extended in a practical and logical way to every pertinent training branch.

Every soldier must be as familiar with enemy tank types as children on the street are with the characteristics of the common makes of cars. All commissioned and noncommissioned officers used in the observation service are to be trained as schooled tank observers. These "tank observers" must be able, on the basis of the behavior of the enemy tanks, to draw accurate conclusions as to the tactical intentions of the enemy and to make clearly understandable reports.

3. *Firing Practice.*

The school is responsible for seeing to it that practice firing equipment that is serviceable and inexpensive to use is developed for all arms, and that the firing practices followed by the school are as close as possible to those used when live ammunition is employed. All training methods which differ from reality in point of adjustments for target, lead, and other

items are to be abandoned. This has been the defect in our small caliber firing practice.

In addition to technical highly perfected devices necessary for its own instructional activities as, for example, films showing firing procedures and electrically controlled target assemblies, the school must also strive to develop suitable training aids for the use of troop units which will be practical even in limited locales without falling too short of "reality."

The training aim of the school should be the schooling of firing instructors from the unit for the unit; advanced training courses for gunners; and close antitank combat training.

The foregoing dissertation is also essentially valid for training in the use of close antitank combat weapons.

The inspector of the all-arms antitank defense, in close conjunction with the inspectors of other arms, is responsible for seeing to it that close antitank combat becomes possible for all soldiers of all branches of the service, particularly those categories of troops which normally are not called upon for combat tasks. The mass engagement of close combat antitank weapons and means is a senseless waste of material if every soldier does not learn to use them with the same confidence as he does his rifle.

In addition to this, the schooling of especially trained close antitank combat specialists in all units is to be furthered with all available means, and this may also be accompanied by special insignia on uniforms, service-grade designations, and the like. Special training in close antitank combat serves to develop the moral stamina of the soldier required when facing tanks. Practical results in antitank combat are to be expected only from specialists, however. The training aim should be the schooling of close antitank combat instructors from the unit for the unit; and advanced training courses for qualified close antitank combat specialists.

4. *Moral Inurement Against Tanks.*

As has been said, the close antitank combat school constitutes the best medium for training the soldier to free himself of the feeling of "helplessness when facing armored combat vehicles." In the close combat school the individual combatant is not only to learn how, by the skillfull exploitation of the weaknesses of the enemy tank, he may approach it with "relative safety," but also to become convinced, by experience, what these weaknesses consist of in close combat. To this end, a true to life mockup of an enemy tank must be available in every close combat school in order that every soldier, at least once, may actually learn how extremely difficult it is for a tank crew to observe with closed ports and blocked observation slits; to pick out close and distant targets with the target periscope in a jolting and lunging advance over rough terrain; to direct their weapons at a target; and to ward off an attacker in their "dead areas."

If no caterpillar tread chassis are available for the practice mockups, the latter must at least be mounted in such a manner as to be subjected to identical lunging and jolting movements.

Although we have rejected the "letting one's self be rolled over by the tanks" as a tactical demand, it remains, nevertheless, as a training demand of first order. Every soldier must have the positive feeling, in the face of enemy tanks, of being able to safely conceal himself in the protecting bosom of mother earth. The fact must become part of his flesh and blood that the threat represented by the tanks does not increase, but decreases with his proximity to them. In fact, he must realize that the tanks can do nothing whatever to him as long as he conducts himself properly and does not lose his nerve.

The Turkish Contribution

Digested by the MILITARY REVIEW from an article by Major E. O'Ballance in "The Army Quarterly" (Great Britain) January 1955.

The information on the Turkish Army contained in this article has not been obtained from official sources. The views expressed are entirely those of the author.—The Editor.

ALTHOUGH Turkey is some distance from the Atlantic Ocean, she is, nevertheless, a full-fledged member of NATO, and, owing to the importance of her strategic position, she is regarded by many as being the keystone of our pattern of defense in the Near and Middle East. In the event of hostilities much would depend upon what type of show she put on, especially in the opening stages.

There is little doubt that any future world war will be resolved on the Plains of Central Europe, that is, assuming, as we must at the moment, that the only potential aggressor is the Soviet Union. However, the control of the Middle East offers so many advantages that it is more than possible that the Soviet Union would be strongly tempted to make a very determined effort to gain control over that part of the world.

So, perhaps, a review of the war potential of Turkey will be of interest, and will enable us to speculate upon any aggressive action that may be taken against her, and upon any possible roles she may be called upon by NATO to carry out. This background may help us to estimate the degree of success she is likely to have.

First of all, there will be a brief reference to the history and tradition of the Turkish Army. During the Middle Ages, the Ottoman Empire had the most formidable army in the world, which reached the height of its fame in the sixteenth century. Then Turkey controlled all of the Balkans, half of Hungary, Mesopotamia, Georgia, Baghdad, Arabia, Egypt, Tripolitania, and Tunisia, extracted tribute from Moldavia, and threatened to overrun Germany. This victorious army was halted finally before the gates of Vienna by the combined French and German Armies in 1529, but not before it had defeated the other Christian armies of Europe, notably the Slav Federation under the Serbian King, Lazar I, at Kosovo in 1389, the combined Western Christian armies under the King of Hungary at Necopolis in 1396, and the Magyars at Mohacs in 1526. The Turks also took the Island of Rhodes from the Knights of St. John in 1522.

The basis of the regular troops of this army was the famous Janissaries and the Spahis of the Porte. The Janissaries, a corps of infantry, were recruited from levied and captured sons of Christians, who were trained to form a privileged caste of scientific soldiers. When they were first formed, in the fourteenth century, they only numbered about 2,000 but as time went on their numbers increased to more than 100,000. The Spahis of the Porte were a body of regular cavalry, similarly recruited, armed with scimitars and bows. Their discipline was extremely strict, which was unusual for that period, and these two bodies probably resembled, to some extent, the Knightly Orders of the West at their best. This *corps d'élite* was supported by a second line army of, perhaps, 40,000 who were as a rule mounted and armed like the Spahis of the Porte. This supporting army was feudal in character and consisted of the Moslem nobility with their personal followers. More than half these numbers were recruited in Europe. To this, in time of war, was added a horde of irregulars, levied chiefly among the mountaineers and

townsmen of the Balkans and Asia Minor. Some Christian soldiers of fortune were enlisted as artillerymen and engineers, who supplied them with, and manned, some of the most powerful cannon and war machines of the age.

The fame and success of this army began to wane in the eighteenth and nineteenth centuries. Three causes are commonly quoted and accepted as being responsible for this decline. The first was that the Christians tended to weaken a morale already sapped by many defeats. Second, it was found to be impossible to maintain the discipline of the Janissaries, whose privileges had become a source of danger. Third, the feudal nobility became more and more independent of the Sultan's authority. Together, these three reasons contributed to make the reorganization of the Turkish Army inevitable, and the destruction of the Janissaries in 1826 marked the close of its history.

Reforms

By that date already, its creation on the accepted western lines had begun, but this reorganization was still far from complete when Turkey was called upon to meet the Russians in 1822, and although the Turkish soldiers displayed their accustomed bravery in action, its defective organization and other causes led to its defeat. Far-reaching reforms were put into effect by Moltke—then a captain—aided by German instructors, from 1835 onward. Turkish officers were sent to German military academies and the Army was reformed on the German model.

Since then, however, the Turkish Army has frequently been on active service. The Crimean War, the Russo-Turkish War of 1887, the Graeco-Turkish War of 1897, the Italo-Turkish War of 1911, and the Balkan War of 1913 all witnessed the employment of the Sultan's available forces, while innumerable local revolts in different parts of the Turkish Empire called for a great exertion and often fierce fighting.

The Turkish Army again made a great effort in 1914-18 where, despite administrative inefficiency and corruption on the one hand and the defective equipment and handling of the fighting troops on the other, it earned the admiration of its opponents by its stubborn endurance and fighting qualities. German leadership undoubtedly played a large part in its successes at the Dardanelles, and to a lesser degree in its other theaters—but friction between German and Turkish officers became a handicap. The Turkish Army developed few leaders of any note during World War I.

After the disasters which marked for Turkey the end of World War I, Mustafa Kemal gathered around him a nucleus of the better-trained younger officers. It was the influence of this new school which brought about the rapid recovery of the Turkish Army, as witnessed by the expulsion of the Greek forces from Asia Minor in August and September 1922. On 6 October 1923, the new Turkish Army triumphantly entered Istanbul.

From that reorganization emerged an Army of about 300,000 men which was formed into nine regional army corps. As the situation became stabilized, the Army strength dropped to about 120,000, at which strength it remained until the clouds began to gather again in 1938.

Reorganization

In February 1954, an expansion and reorganization was being carried out, and as yet no intimate details are generally known; so in examining the structure and framework of the Turkish Army we must work on the latest previously known figures. The Army is basically of a regional nature so it is unlikely that there will be any far-reaching changes. In 1945, the land forces of the Turkish Republic consisted of 163 infantry battalions, 42 field,

44 mountain, 5 howitzer, and 27 heavy artillery batteries, 48 cavalry squadrons, 13 machinegun mounted companies, 29 pioneer companies, 8 transport companies, 3 radio-telegraphic companies, 1 light projector company, and 8 field hospitals. These units were formed into 18 infantry and 5 cavalry divisions, distributed over the three Military Inspectorate Regions. These figures are quoted in full as they are the last firm ones available, and they give an idea of the composition of the Turkish forces, which are probably roughly in the same proportions today.

Each of these Military Inspectorate Regions consisted of between two and four army corps and was under a senior officer who was the designate commander of the corresponding army on mobilization.

The distribution of the army corps in the three Military Inspectorate Regions was as follows: The 1st Military Inspectorate Region, with its headquarters at Ankara, consisted of the 2d Corps, with its headquarters at Balikesir, the 3d Corps, with its headquarters at Istanbul, and the 4th Corps, with its headquarters at Eskisehir; the 2d Military Inspectorate Region, with its headquarters at Konya, consisted of the 1st Corps, with its headquarters at Afiun Qarahisar, and the 5th Corps with its headquarters at Konya; and the 3d Military Inspectorate Region, with its headquarters at Diarbekr, consisted of the 6th Corps, with its headquarters at Toqat, the 7th Corps, with its headquarters at Diarbekr, the 8th Corps, with its headquarters at Erzinjan, and the 9th Corps, with its headquarters at Sariqamisim.

An army corps consisted of 2 infantry divisions, 1 heavy artillery regiment with 2 to 4 batteries, 1 squadron of corps cavalry, 1 technical company, and 1 company for communications and liaison.

The normal infantry division consisted of 3 regiments of 3 battalions and 3 machinegun companies each, 1 artillery regiment of 2 field and 2 mountain batteries, 1 pioneer company, and 1 company for communications and liaison. The first 9 divisions were numbered from 1 to 9, while the remaining 9 bore different numbers inherited from the old organization. A cavalry division consisted of 3 regiments of 3 squadrons, 1 machinegun mounted company, and 1 or 2 mountain batteries each. The numeration of the cavalry divisions was also inherited from the old organization. Their distribution was as follows: 1st Division—to the north of Mosul, 2d Division—Thrace, 7th Division—Anatolia, 8th Division—Van, and the 14th Division—Urfa.

In addition to the units just mentioned, there were the following: The National Guard of the Great National Assembly consisting of 1 infantry battalion, 1 machinegun squadron, and 1 cavalry squadron; four commissariats of 4 battalions and 4 machinegun companies each, in Artvin, Diarbekr, Adana, and Adrianople, respectively; 40 heavy batteries and technical units for the "fortified places"—Smyrna, 8 batteries, 1 projector company, and 1 pioneer company; Kara, 12 batteries, 1 pioneer company, and 1 liaison company; Erzurum, 12 batteries and 1 liaison company; and Chatalja, 8 batteries. There were also 16 batteries of heavy coastal artillery and 1 railway battalion.

Mention must be made in this military survey of the *gendarmerie*, who number between 25,000 and 30,000, all of whom are recruited on a voluntary basis. They are formed into nine flying battalions and numerous companies and posts. There are also five mounted Guards Regiments, one each at Ankara, Chorum, Yozghad, Elaziz, and Erzinjan.

The infantry is, after the German model, the *corps d'élite* and forms the bulk of the Army. The next strongest arm is the cavalry, which is being retained as such until mechanization is complete. The artillery strength is only slightly below

that of the cavalry, although it is difficult to assess the exact ratio as men are "lent" and "transferred" as required. The number of specialists, compared with Western Armies, is absurdly low, and will prove to be a big handicap in the event of war. Large numbers would have to be trained and this would take time. The regular element of the Army consists of a hard core of both long- and short-service officers, warrant officers, and noncommissioned officers.

Conscription

Conscription exists in Turkey; thus, the large pool of trained reserves is constantly being increased. Military service is accepted as part and parcel of everyday life by the people, largely, perhaps, because of their military traditions and background. According to the 1950 census, the population of Turkey is given as 20,934,670, and about 175,000 young men are called up each year. They are called up at the age of 20, and at the present time are serving for 2 years. While it is possible for students and certain others to defer their call-up to enable them to complete their studies, it is never possible to avoid it completely.

The strength of the Army rose to its peak of 600,000 men in 1945, but numbers dwindled after the end of the war. In 1954, it was estimated that about 350,000 were serving. Working on these figures it will be seen that in the event of an emergency, Turkey would be able to mobilize up to 1 million fighting men, with the possibility of increasing that figure in time. These are very encouraging figures, especially in view of NATO's current difficulty in filling out its "paper divisions."

Exclusive of any Western war material that has recently arrived, the bulk of the arms and equipment of the Turkish Army is neither modern nor uniform. The rifles alone are of many different types, giving the resultant ammunition problem. It was estimated in 1945 that it had between 1,200 and 1,300 light automatics; about 800 medium machineguns—about 40 per division; and between 600 and 650 field guns of various types and sizes. The basic infantry weapons are manufactured in Turkey from prototypes of European models, and a cartridge factory is being developed in Ankara, but as yet its production is low.

During World War II, some British military supplies and equipment were made available to Turkey, but these supplies dwindled after 1945. As a matter of interest, the men still wear British pattern steel helmets and battle dress. However, as a result of the Truman Doctrine of 1947, military aid in more considerable proportions began to be provided, and has included tanks, antitank guns, machineguns, bazookas, radar, signaling equipment, vehicles, and medical supplies.

The heavy guns and howitzers are of American pattern, but certain of the divisional artillery pieces, such as Bofors light antiaircraft guns, are of British origin. Owing to the mountainous nature of the country, heavy tanks have not been sent, but instead they are being equipped with light tanks of British origin and with American *M-36* "tank destroyers" mounting 90-mm guns.

There are two foreign Military Missions, one British and one American, now in Turkey with the object of training the Army to use the modern weapons and equipment now being provided, and members are attached to all schools of instruction and formations in an advisory capacity. Also, Turkish officers are sent for attachments to Western forces, and attend schools and courses of instruction in both Great Britain and the United States.

The Turkish brigade in Korea undoubtedly provided many valuable lessons and much experience in the handling, organization, and training of troops for warfare in modern conditions. Until quite recently,

many of the senior officers were out of date and of a very conservative disposition, and were considerably hampering the younger and keener officers who had either seen active service in Korea or had been attached to other Western forces. This is being remedied, and many of the older officers are being retired.

Fighting Qualities

The fighting qualities and the individual bravery of the Turkish soldier need no advertisement, and the performance he has given in Korea has shown the world what he can do when he is well led. His morale is good and he is strongly imbued with patriotic ideals. The Russian is his hereditary enemy and communism has made no headway in Turkey.

Four-fifths of the Turks are peasants, having all the soldierly qualities of those who live "close to the earth." They make excellent soldiers, having great powers of endurance and a natural aptitude for the use of ground. Their chief disadvantage is lack of initiative, which weakness reflects itself in a lack of good warrant officers and noncommissioned officers.

A brief mention must be made of the Air Force and the Navy. The Air Force is very small compared with the size of the Army. Jet fighters have been given to Turkey, and Turkish pilots are being trained in their use in support of the land forces. Training of both aircrew and groundstaff is being carried on at full speed, but it will be considerable time before the Turkish Air Force will be able to make any great contribution to the common cause in this field.

In regard to the air, the largest contribution Turkey has made is by the providing of a chain of airbases along the southern part of her territory, well back from the Soviet Union, along the line from Diarbekr, through Adana to Smyrna. These will be available not only for defense, but also for counteroffensive measures when required.

Again, the Navy is small considering the length of coastline that it is required to defend, which is 4,445 miles. The fleet now comprises 12 destroyers, 11 submarines, 6 minelayers, and 30 minesweepers. Part of this force has been placed under Lord Mountbatten's command, and the remainder is kept for the defense of the Turkish coast.

One of the most important factors when considering a country's war potential is its internal communications which, in the case of Turkey are, by our standards, very poor. The Republic of Turkey consists of 296,184 square miles, compared with Great Britain's 88,550 square miles. In 1949, there were only 13,530 miles of roads, compared with Great Britain's 177,000, of which only 7,900 miles were considered to be all-weather. This limitation is fully realized and in order to improve the mobility of the Army an extensive program of roadbuilding is being undertaken. Since American aid was granted in 1948, work has been going on apace, and although there are many drawbacks and difficulties to roadmaking in the mountainous parts of Turkey, this mileage must by now have increased considerably. Even so, the number of divisions that could concentrate in any one area and be maintained in action for any period of time would be limited.

Economic Picture

Again, by our standards, the railways are grossly inadequate, there being only 4,882 miles in 1949 compared with Great Britain's over 30,000 miles. This is being remedied and it has recently been reported that that mileage has now been doubled and that the railway has been extended to the Iranian frontier, but priority is given to road construction.

In regard to the economic side of the picture, Turkey is primarily an agricultural country, and until recently was not a too progressive one either, but during the last 3 years land reforms have been

in progress and over 2 million extra acres have been brought under cultivation. An example of the great progress that is being made in that direction is that in 1950 there were only 6,000 tractors in the country, while in March 1953, there were 35,000. That number must have increased considerably by now. In 1952, she had 1.5 million tons of cereal, including 1 million tons of wheat for export, which made her fifth among the wheat-producing countries of the world. Her wheat surplus for the year 1953 has been estimated at 2.5 million tons.

Her industrial and mineral resources are not of any major importance, but since 1948 the production of iron, chrome, and copper has been increased considerably, and that of manganese has risen to over 106,395 tons. Soft coal production has also greatly increased, but all that is consumed internally.

New ports are being constructed and existing ones enlarged, and hydroschemes and other works are being put into operation. Although almost exactly half the national budget goes for defense, the economic field has not been neglected; but even so, the obvious deduction we can draw from this is that Turkey cannot be regarded as an industrial base capable of supporting a modern motorized army, and that supplies would have to be shipped to her if she were engaged in warfare on a large scale.

Having looked briefly at Turkey, let us examine a review of recent events. In January 1948, aid was given to Turkey by virtue of the Truman Doctrine. In July 1950, she sent a brigade group to fight in Korea.

In September 1951, General Omar Bradley, then Chairman of the United States Joint Chiefs of Staff, Field Marshal Sir William Slim, Chief of the Imperial General Staff, and General Lecheres, Chief of the French General Staff, visted Ankara to discuss matters with the Turkish military authorities. As a result, Turkey was elected to the Security Council of NATO. This led to a strong protest from Moscow, which was ignored.

On 18 February 1952, Turkey became a full member of NATO and expressed a distinct desire, together with Greece, to become part of the existing framework rather than form part of a separate command. During a visit to SHAPE, in Paris, the Turkish Prime Minister said that 95 percent of the Turkish forces would be placed at the disposal of NATO, which means that except for a small portion kept solely for home defense, all of the Turkish war machine would be made available without any qualifications.

Strategic Position

In July and August 1953, visits were paid by both the British and the United States Navies, leading to protests from the Soviet Union. These were replied to coldly, indicating that Turkey was not to be overawed or browbeaten.

In September and October 1953, Turkey and Greece, for the first time in history, combined for maneuvers. These were supported by the British and United States Navies and Air Forces and were watched by prominent NATO officers. In Exercise *Weldfast*, which lasted 9 days, over 100,000 troops—Turkish, Greek, and Italian—supported by British and American planes and ships, took part in a large-scale operation in Thrace.

In October 1953, the 6th Tactical Air Force, with its headquarters at Izmir, came into operation, having a Turkish, Greek, and American Staff, to co-ordinate the air defense systems in that part of the world.

The strategic position of Turkey is very important. The Balkans, of which Turkey can loosely be described as one, lie on the flank of any major campaign for the struggle for the mastery of Europe. They also lie in the path of any aggressor to

the Middle East from Europe, and the Near East is the only land route to Africa. Turkey stands astride the Bosporus and the Dardanelles, and bars Soviet access to the Mediterranean. All the Balkan and Near East countries are deficient in communications, being either mountainous or desert, and, accordingly, the advantage of the string of forward airbases in Turkey cannot be overemphasized.

The NATO hold is by no means firm in the Balkans. Bulgaria and Romania are under Soviet domination. Yugoslavia, a Communist state, is independent, but is an enigma of the future. Albania, another satellite, is cut off and is not so important. Greece, the weak link in the Balkan chain, has only recently been saved from communism, and has a very narrow depth in the area of Thrace. Also, in the event of hostilities, she would probably have a considerable active fifth column element. The command of the Mediterranean is essential if Greece is to be supplied and bolstered.

The deduction that can be drawn from this is that Turkey, by virtue of her position, is the keystone of the Balkan-Near East defense. A strong and resolute Turkey would encourage Greece to follow suit, but any signs of weakness on her part might well bring the entire Balkan house of cards tumbling down with disastrous results.

On the credit side of this picture, Turkey is on friendly terms with all the Moslem countries, except Egypt, and has recently signed a Tripartite Treaty of friendship with Greece and Yugoslavia. As Greece is her traditional enemy, this augurs well for the future.

Looking southward, the Soviet Union desires three things, access to the Mediterranean for her fleet of submarines, the oil of the Middle East, and control of the Suez Canal area. The items are listed in their probable order of importance.

If the Soviet Union could get access to the Mediterranean, she could make it extremely difficult, if not impossible, for NATO supplies to reach the Balkan countries. The oil of the Middle East she covets for herself, as well as for the factor of denying it to us. Control of the Suez Canal area means a "toehold" in Africa. If she obtained that "toehold," fighting a coalition as she would be doing, each with different interests, differences as to how the war should be conducted, might arise between the United States, who has little interest in Africa, and Great Britain and France, whose interests there are considerable. Once the Soviet Union reached the Suez Canal, NATO forces would have to be redeployed, perhaps very wastefully.

Looking at the map, and without going deeply into any complicated strategical or tactical possibilities, it would seem that there are three courses of action open to the Soviet Union. It would naturally depend very much on her degree of success, or otherwise, in the opening stages as to which course she would follow and how much force she would allot to this "Turkish sideshow."

The first course would be to attack Thrace, through Bulgaria, with the object of driving a wedge between Greece and Turkey and then pressing on toward the Bosporus. This seems to be the most probable as the Soviet Union is primarily a "landpower," and she would risk much to gain a "door" into the Mediterranean. Greece has little depth in that area.

The second course could be to march on Iran through the Caucasus, the traditional land route to the Middle East. She might try and force this route, at the same time compressing Turkey westward. The difficult terrain would make any large-scale operations very slow and difficult, although it would lend itself admirably to infiltration tactics.

The third course, which not everyone takes into consideration, would be a com-

bined air-sea-land operation with the object of taking the land in the area of the Bosporus by direct attack. During the last war, the Soviet Union did several amphibious operations in the Black Sea, although little is really known about them, so, therefore, such a course cannot entirely be ruled out of the question. Bold action and surprise are worth much in war, and the control of the Dardanelles and the Bosporus must seem to the Soviets to be a very glittering prize indeed.

Now we must consider what counteraction Turkey would be in a position to effect. The bulk of her forces would, of course, be deployed under NATO direction, but she has two very obvious tasks, one on each flank. One is Thrace and the other is the Caucasus. She must have sufficient strength on each flank to hold an initial attack, and also to have reserves available for counterattacking and for exploitation. Again, NATO may require her to move up and hold the line of the Caucasus Mountains from the Black Sea right across to the Caspian Sea to seal it off from the Soviets.

The problem then is, what type of show will Turkey, the keystone, put up? The answer is a hopeful one. The picture painted of her war potential and of her armed forces is an encouraging one. The country lends itself to defense, and enormous numbers would have to be brought into action to make any headway against her.

The conclusion that can be arrived at is that if her Army is given adequate naval and air support, especially in the early stages of hostilities, there is little doubt that Turkey will be able to stand firm and will become, not merely a "running sore" but a "grievous wound" in the Soviet Union's side.

ABC Warfare

Digested by the MILITARY REVIEW from an article by Squadron Leader B. K. Roy in "The Journal of the United Service Institution" (India) October 1954.

UP UNTIL 1905, the world of physics held fast to two basic laws: the law of the conservation of matter; and the law of the conservation of energy. Matter and energy could not be created nor destroyed. Albert Einstein, then a young man working in a Swiss patent office, upset the entire structure of physics with a very short equation: $E=mc^2$. Nothing is indestructible. Matter can be changed into energy and vice versa. E is the energy you will get if you destroy a mass m. This was not all. The destruction of a minute amount of matter will release a stupendous amount of energy. The creation of energy involves *a loss of mass* in the act of building big atoms from small ones, or splitting the largest of atoms into smaller ones; that is, either in the process of fusion—the principle of the hydrogen bomb—or in that of fission—the principle of the uranium bomb. Using Einstein's formula, scientists claim that a pound of coal turned completely into energy would supply as much energy as 1.5 million tons of coal burned in the usual way.

The sun produces its tremendous energy and temperature, 30 million degrees Fahrenheit in the outer ring to 50 million degrees Fahrenheit in the center, by this same process. The loss of mass in the sun due to this process is estimated at 5 million tons a second. The sun can carry on at this rate for 30,000 million years.

To test his theory, Einstein himself had suggested the use of radioactive elements because they naturally generate tremendous amounts of energy and shoot out alpha and beta particles with speeds of thousands of miles a second. A crystal of a radium salt, for example, is 5 degrees warmer than the temperature of the air

and it will go on generating this heat day and night, for hundreds of years.

The Atom

In nature there are 92 elements. The smallest unit of an element is its atom. The atoms are further divided into the basic particles of matter of which three, electron, proton, and neutron, are the most fundamental. An atom has a diameter of about 10^{-8} centimeters and consists of a nucleus around which electrons revolve in one or more orbits. The nucleus of an atom contains protons and neutrons. The atomic particles are very small in size. Relatively speaking, within the atom, between the atomic particles, there are *immense* distances, the arrangement being similar to that of the solar system. Thus, the atom is largely void space. That is why all matter is porous.

The *electron* is negatively charged and is the basic unit of electricity. It moves at great speed and is capable of being accelerated to attain velocities of approximately 180,000 miles a second. An electric current is nothing but the movement of electrons along a conductor.

The *proton* is larger than an electron. Protons determine the nature of an element. The number of protons is constant for an element but the number of neutrons varies.

The *neutron* is a trifle larger than a proton. It can break itself into an electron and proton. Its electric neutrality is of vital significance. Because it is *neutral*, it is neither repelled nor deflected, has great penetrability of matter, and is a fatal agent in the production of biological injury. It is the instrument of nuclear fission.

Isotopes are elements having the same atomic number but different atomic weights. The atomic number is the sum of the protons, while the atomic weight is the sum of the protons plus neutrons. Each of the 92 elements has a given number of protons which is not changed. With the addition of neutrons it is possible to change the atomic weight. This is how radioisotopes for medical use are produced. Elements placed within an atomic reactor capture radiations by absorbing neutrons, become excited and then begin to emit alpha and beta particles, and gamma rays, many of which are used for location, diagnosis, and treatment of diseases. Radioactive iodine is extensively used for thyroid gland disorders; radiocobalt, radioiridium, and radiogold in cancer. In plain language, iodine, cobalt, iridium, and gold are cooked in the atomic furnace until they acquire a certain amount of radioactivity and become isotopes of the original element. This, as yet, is a very expensive process.

Nuclear fission is the process by which an atomic nucleus splits into fragments after it has been hit by a particle. Many particles like protons, deuterons, and alpha can produce fission. However, neutron is the best so far. Because of its neutral charge, it gets into a nucleus easily. Many elements can be split with high energy particles but not all of them can "keep it up" by producing extra neutrons which is the peculiarity of uranium and plutonium.

In a chain reaction, neutrons released from the fission of one nucleus bring about the fission of at least one more which, in its turn, releases neutrons which start further fissions. A chain will die out or multiply, depending on the average of the number of new fissions that result from a previous one. If this ratio averages less than one, the chain dies out; if it is greater than one, it grows.

It is estimated that between 20 and 60 pounds of uranium are used for an atom bomb, which with its control apparatus, shielding gear, and other equipment has a total weight of 5 to 10 tons. The fission process of an atom bomb goes on in geometrical progression, with each fission nuclear energy liberated, until

about the 75th phase when the energy can no longer be contained and explodes, resulting in heat, blast, and radioactivity. The entire process does not require more than ½ to 1 microsecond.

So much for the uranium version of the atom bomb. The next and definitely more dangerous weapon is the cobalt bomb. Readers may recall the representation made in the Australian Parliament some time ago; an assurance that the British will not make any tests with cobalt bombs on Australian soil. The reason for Australian uneasiness was this: cobalt 59 can capture free neutrons let loose by a nuclear fission uranium bomb or nuclear fusion hydrogen bomb. By capturing neutrons, the stable cobalt 59 becomes radioactive cobalt 60, which emits beta and gamma rays and has a half life of 5.3 years. Half life is the time required for a radioactive element to lose, by radioactive decay, half of its radioactive atoms. Some elements have a half life of a few seconds only. Others, uranium for example, take 4, and thorium 8, billion years to lose 50 percent of their radioactive atoms. Obviously, if cobalt were used in the atom bombs, it will maintain the danger of radioactivity over a wide area for years.

An atom bomb may be exploded at various levels:

1. Air burst—2,000 feet above sea level —Nagasaki. This produces the maximum blast, thermal effects, and gamma radiation.

2. Underwater burst—throws up more than a million tons of water and creates a 1,000-foot-high wave. Also causes radioactive rain. However, the radiation hazards of the underwater burst are a little less and more delayed than those of the air burst.

3. Ground level burst—at an altitude of 75 feet and below. The effects are more confined and intense.

The hazards of an atomic explosion are:

1. Blast.

2. Heat—infrared, ultraviolet, and secondary flame.

3. Radioactivity—gamma, beta, and alpha rays, neutrons, and induced radioactivity.

The shock wave or the blast effect of the atom bomb is the result of the positive and negative air pressure and is by far the most destructive effect of the weapon. If the weapon is fuzed to burst at 2,000 feet as at Nagasaki, there will be total destruction within a radius of ½ mile from ground zero. Damage in different degrees, from severe to light, will spread out to a radius of 8 miles. Next is the thermal effect: 20 to 30 percent of the fatal casualties at Hiroshima and Nagasaki were due to this. According to British estimates, the atomic kill in Japan was 230,000 to 250,000 casualties with 104,000 to 124,000 deaths.

The *hydrogen bomb* follows the process by which the sun produces its energy. The sun consists largely of hydrogen and helium and has a low concentration of carbon and oxygen with a few heavy elements. Because of the extremely high temperatures, about 50 million degrees Fahrenheit, molecules and compounds do not exist on the sun. With this high temperature there is also the high pressure of about a billion tons per square inch, and these conditions are ideal for the maintenance of reactions.

It has been known for sometime that very large amounts of atomic energy would be liberated from the synthesis of heavy atomic nuclei. However, reactions of this kind could take place only when atomic particles collide at high velocity and this can only happen under temperatures as high as those in the sun.

It is only likely that a hydrogen bomb will use a uranium bomb mechanism as a detonator to produce the temperature and pressure necessary for the synthesis of helium from deuterium or tritium.

Although the hydrogen bomb is esti-

mated to be 1,000 times more powerful than the atom bomb, it should be understood that the destructive effects will be much less than 1,000 times those produced by the atom bomb. This is because the effective distance of the blast increases as the cube root of the increase in power; and heat and atomic radiation as the square root of the increase in power. Quite apart from the question of the availability of the fissile elements, there is the problem of cost. The atom bombs are very killing no doubt, but the economic consequences of producing and stockpiling them are equally ruinous. Where will the money come from? If atomic industry were allowed to develop freely, there might have been a possibility of its paying for the weapons. However, atomic knowledge, except for a few chosen scientists, is taboo.

Chemical Warfare

The principal means of chemical warfare are gas, used in solid, liquid, or vapor form; incendiaries; and smoke. By itself, smoke causes no damage and it can be left at that. *Gas* produces physiological incapacitating effects on the body. A chemical agent like gas produces its effects by chemical reaction with the tissues of the body through breathing, swallowing, or direct contact with the skin. The area affected by a chemical bomb is many times greater than that affected by a similar size high explosive bomb. The effects of the high explosive bomb, concussion of the explosion and the striking force of the flying fragments, do not extend beyond a relatively small area surrounding the point of burst. The contents of the chemical bomb, on the other hand, in the form of gas or vapor, cover a much greater area. The action of a chemical bomb is uniform whereas that of the high explosive bomb is rather erratic. Within the danger zone of a high explosive burst not everyone will be hit by a flying fragment. There is the element of chance which is absent in the case of the chemical bomb. Then, again, the fragments of a high explosive bomb follow their own trajectories. A shallow trench or copse of trees will provide shelter to some; however, uniformly spread out chemical agents will not be stopped by such obstacles.

Gas is not normally used in winds above 15 miles an hour. Although a higher wind may blow away nonpersistent gases, it cannot remove the danger that results from contamination by persistent liquids. There are really very few days when gas, properly employed, cannot be effectively used. Gases are classified according to their physiological effects: tear gases; irritant gases; suffocating gases; blistering gases; and toxic—nerve—gases.

Tear gases affect only the eyes. Irritant gases, produced from arsenical compounds, cause severe nausea and are effective even in very low concentration. Suffocating gases attack the pulmonary system and may prove fatal to unprotected persons within 10 minutes. They are very dangerous weapons in air attack. The blistering gases attack the eyes and the lungs and the most dangerous thing about them is that their effects can be noticed only when it is too late. They also possess great penetrating power. Toxic gases act on the nerves and produce death by paralyzing the central nervous system. A few breaths of hydrocyanic acid are sufficient to cause death within a few minutes. Modern chemistry has developed toxic gases 10 times more dangerous than those previously known. These chemical agents may be used either in the form of gas bombs or by means of spray apparatus. The spraying apparatus is the most economical and efficient method of disseminating chemicals.

The *known* principal war gases and their properties are shown in the chart on page 101.

In considering gas attacks, most people are misled by the fact that gas on the open ground is quickly dissipated and

easily neutralized by decontamination. In fact, the most serious of all is the gas liberated indoors. It is not possible to count on closed buildings either, because it is impossible to keep them airtight for any length of time in summer; and a percentage of the bombs used in gas attacks will create enough opening for gas to go in and to do its lethal job. Decontamination of unprotected personnel and buildings in large concentrated areas is an impossible task, and a gas with a high explosive air attack is sure to produce the most serious casualties and demoralization among the people. The gravest dangers of air attacks are the element of surprise and the demoralizing effect of the fear of the unseen and unknown.

Incendiaries are chemical agents capable of causing direct fire to material and personnel. As soon as the chemical agent comes into contact with the surrounding air, it ignites itself and generates sufficient heat and flame to set fire to ordinary combustible materials. Incendiaries are far more effective than high explosives in producing fires and that accounts for their popularity in World War II.

Generally speaking, incendiary agents are of four types:

1. Spontaneously inflammable materials —phosphorous and sodium.

2. Metallic oxides—thermite or thermate.

3. Oxidizing combustible metals—magnesium.

4. Inflammable materials—celluloid, resin, pitch, and solid oil.

Phosphorous is most important. On exposure it combines with oxygen and ignites spontaneously. In addition to its incendiary effects on material, it is very effective against personnel because it sticks and burns through clothing. Mixed with inflammable liquids, it can be used very effectively from aircraft with spraying apparatus.

Thermite is a mixture of iron oxide and aluminum. When ignited, this mixture produced enormous heat. For starting a conflagration, thermite is perhaps the most effective chemical agent.

Thermate is modified thermite, mixed with other suitable chemicals—aluminum and barium nitrate—according to *military requirements.*

Magnesium, when heated to its ignition point, combines with oxygen and burns with a dazzling white heat. It is very difficult to put out. Also, it is *completely* consumed by combustion. In combination with thermite, it is one of the most effective incendiary agents.

Oxidizing combustible metals are incendiary mixtures containing chemical agents like barium, potassium nitrate, with carbon, magnesium, and sulphur. Thermite mixtures are more effective and have replaced these combustible mixtures.

Inflammable materials include petroleum oils, carbon disulphide, wood distillation products, celluloid, pitch, resins, and many oils and liquids which are not spontaneously inflammable. They help as secondary and liquid incendiary agents.

Thermite and magnesium, however, are not the best materials for generating heat. Petroleum, pitch, phosphorus, and sodium generate a much greater quantity of heat; however, considerations of their weight and burning characteristics make them somewhat unsatisfactory as incendiary agents. During World War II, much research went into the development of solid oils possessing the most desirable incendiary properties. The best known of these jellied oils are saponification of gasoline in butyl methacrylate, and gasoline saponified in napalm. These are more effective than the thermite-magnesium combination.

In air attack, various types of incendiary weapons such as incendiary bombs, magnesium bombs, solid oil bombs, and incendiary sprays are used.

Incendiary weapons can start fires si-

multaneously over a very large area. Combined with high explosives, incendiaries played havoc with Hamburg in July 1943. Similarly, incendiaries left Tokyo in ruins in March and April 1945. In their power to damage property and life, incendiaries come second only to atomic weapons. In summarizing the effects of bomb damage to German cities in World War II, on an equal weight basis, incendiaries were 4.8 times as effective as high explosive bombs on residential areas and against smaller industrial and mercantile properties.

Type	Name	Persistency	Odor
Tear	Brombenzylcyanide	3 to 7 days	Sour fruit
	Chloroacetophenone	10 minutes to 1 hour	Apple
Irritant	Adamsite	10 minutes to 1 hour	Nearly odorless
	Diphenylchlorarsine	5 to 10 minutes	Boot polish
	Diphenylcynarsine	5 to 10 minutes	Garlic
Suffocating	Phosgene	10 to 30 minutes	Hay
	Diphosgene	15 minutes to 1 hour	Bad smell
	Chloropicrin	1 to 4 hours	Sweet
Blistering	Mustard gas	1 to 7 days	Garlic
	Lewisite	1 to 7 days	Geranium
	Ethyldichlorarsine	1 to 6 hours	Irritating
Toxic—nerve	Hydrocyanic acid	5 to 10 minutes	Almond
	Cyanogen chloride	10 to 20 minutes	Irritating

Bacterial Warfare

Diseases kill more human beings than perhaps any other form of disaster. The pathogenic microbes that cause disease among humans, animals, and plants can be used as military weapons. After the Germans had gas in World War I, the Allied scientists were quite worried about the possibility of their using bacterial agents; however, the state of technical development at that time did not favor the use of this weapon. The Germans and the Japanese had been carrying on intensive researches on this aspect of warfare. Japan did make a bacterial attack on the Chinese town of Chaugteh prior to World War II. According to reports, the Japanese laboratory could produce about a ton of bubonic plague bacteria per month. Today, all the great powers are accusing each other of developing the weapons of bacterial warfare.

Bacteria are living organisms with two special qualities—they cannot be seen, sometimes not even with a high-powered microscope; and they can multiply within the body they invade. It should, of course, be understood that all bacteria are not harmful. If they were, the human race would have ceased to be ages ago. Some bacteria are positively beneficial; some are harmful, and the rest, neutral. Bacteria are generally grouped according to shape and classified according to their similarity to the animal or the vegetable world:

By shape

Cocci—minute spherical cells
Bacilli—rod-shaped cells
Spirella—spiral filaments

By class

Protozoa, Spirochetes	animal
Fungi, Actinomycestes	vegetable
Pleuropneumonia, Rickettsial, Viruses	other forms

The size of bacterial agents ranges between 1/5 micron and 1/100 micron in diameter. A micron is 1/25,000 of an inch. Pathogenic bacteria cause chemical changes in the tissues and fluids of the body they attack. These changes also result in the production of toxins. To counteract the effect of toxins, the natural defense mechanism of the body produces antitoxins or antibodies. Certain nonpoisonous toxins, known as toxoids, can be artificially produced in the body to kill off or neutralize pathogenic bacteria—vaccines and other immunizing sera, for example. Bacterial agents require a certain amount of time, incubation period, from hours to weeks according to the type of bacteria, before they can produce harmful effects on the tissues and fluids of the body.

To be effective in war, bacterial agents should be able to meet certain requirements. Broadly speaking, they should produce casualties, infect easily and spread quickly, survive in unfavorable conditions, be available in quantity, be difficult to detect, and act quickly.

The following bacterial agents have remarkable possibilities: cholera, diphtheria, dysentery, influenza, leprosy, malaria, meningitis, plague, pneumonia, poliomyelitis, smallpox, syphilis, tetanus, tuberculosis, and typhus.

It should be noted that against some of these—diphtheria, smallpox, and tetanus—there are very effective vaccines. Leprosy and tuberculosis are very slow-acting; and syphilis requires direct contact. As such, these agents may not be considered as very practicable weapons of bacterial warfare.

In many ways the principles of bacterial warfare resemble those of chemical warfare. The toxity of a chemical agent is tantamount to the potency of a bacterial agent which will be required to contaminate a target area in very much the same way. Bacterial agents will be spread like chemical agents—from the air with bombs and sprays. Insecticides are being spread on crops and malarial areas cleared in many parts of the world. The technique is already there. There is one uncanny aspect of bacterial warfare and that is the unlimited possibility it offers to sabotage by enemy agents.

The power of bacterial warfare can be gauged from the ravages of epidemics; it is no longer a matter of speculation. Bacterial agents will produce casualties but no damage to property and material. Against personnel and living things they will be disastrously effective. Hormone bombs, however, could kill off all plants and crops by speeding up their growth.

Weight for weight, neither high explosives nor chemicals, nor bacterial agents can produce anything like the disastrous effect of an atomic explosion. It should not be forgotten, however, that the over-all weight of an atom bomb is somewhere between 5 and 10 tons, and it needs at least a *B-29* to carry it. Also, its production and costs are prohibitive. Only a few top class world powers can indulge in such luxury and that, too, **not without** grave consequences to their **national** economy. Beside the money and material factors, production of atomic weapons will tie up a very large number of technical personnel, between 100,000 and 150,000 men with varying degrees of technical skill and scientific knowledge.

As against these, bacterial weapons will require very simple factories and a small

number of men. The factories will be small enough not to make profitable or recognizable targets from the air. In undeveloped and semideveloped countries where mass inoculation and immunization are not possible, bacterial weapons will create havoc. Then there is another very vital factor to consider: the nature of casualties. Bacterial weapons, unlike atomic weapons, will not kill at once. There will be always chances of cure and, as such, their victims will tie up a disproportionately large amount of the nation's medical resources. Every house, if it escapes becoming a morgue, will be a hospital. It is a devilishly seductive weapon, cheap and effective. It is difficult to see why a nation whose very survival may be in question should not feel tempted. Ethics do not come into it at all. The only morality in life is to preserve life and make the prospect of living a pleasure. Anything contrary to that is immoral. The choice between bubonic plague and napalm may be a technical-legal problem. Humanity's choice is obvious: it is, really, neither.

The Soviet Union's Transport Network

Digested by the MILITARY REVIEW from an article by Squadron Leader J. F. L. Long in "Air Power" (Great Britain) January 1955.

IT IS, perhaps, best to try at the outset to establish in our minds the relationship of the various branches of the transport network. Its backbone is the railway system. This system, unevenly disposed although it is over the face of the Soviet Union, links the widely separated centers of industry and serves as industry's main supply line for raw materials. Finished products are moved by it to markets sometimes thousands of miles distant. The exchange of goods between industrial and agricultural areas is also primarily the duty of the railways. This they must do all the year around for, unlike marine and road transport, the railways are not immobilized for long periods by the severity of the climate. In war, as the Soviet's transport chief, Kaganovich, stressed at the railway conference held in the Kremlin, it would be upon the railways that the greatest burden of all would fall—that of moving troops and supplies to the battle areas. Dislocation or partial destruction of the vital parts of this system would undoubtedly be a calamity of the first magnitude.

Much older than the railway system, and a valuable supporting service in certain areas, is the network of inland waterways, about a quarter of a million miles of which are navigable. Although some of the greatest of the world's rivers lie east of the Urals—Ob, Yenisey, Lena, and Amur—the network is most highly developed in the Soviet Union's western regions. This is not as surprising at it may seem, since all the great rivers—the Volga, Amu Darya, and Amur excepted—flow northward to empty into the Arctic Ocean and it is only comparatively recently that really serious attempts have been made to use them as freight channels. All are subject to severe icing for 4.5 to 9 months of the year, depending upon their location.

The western waterways offer considerable scope for the movement of bulky freight in both a north-south and an east-west direction. Where nature erred, man has altered. Today, hydroelectric, irrigation, and waterway improvement go hand in hand. By 1952, with the inauguration of the Volga-Don Canal, shipping was able for the first time to pass from the Caspian to the Black Sea and from either, via the Volga, northward to Moscow and Leningrad, and then into the Baltic or White Seas. East-west movement is possible

from Ufa and Molotov, on the western slopes of the Urals, to Leningrad, Moscow, and Rostov. A second great system of waterways, comprising the Western Dvina, Neman, and Vistula in the north and the Dnepr in the south, also offers east-west as well as north-south movement. However, the chief freight artery today, as of old, is the Volga which, with its main tributaries, deals with more than 50 percent of all freight carried by the Soviet inland waterways. This percentage is likely to rise still further in the next 6 or 7 years.

One persisting factor that prevents the economic handling of freight by the inland waterways—charges for most goods are almost the same as on the railways, although delivery dates are four or five times longer—is the impossibility of equalizing the volume of freight carried on outward and inward journeys. Of the types of freight carried in 1935, more than half was lumber, a ninth oil, and a ninth building materials. Compared to the 84.5 percent of all freight moved by the railways in 1953, the inland waterway system dealt with only 6.3 percent. However, in doing so it spares the railways from what could be a critical overloading.

Coastal shipping, including shipping working the northern sea route, attracts just over 5 percent of all freight. This figure is very small proportionately, but it disguises the real importance of the merchant marine's role. To this service falls the task of shifting mineral and other valuable freight from settlements strung out along the bleak far northern coast during a very short summer shipping season and of transporting to these settlements equipment, food, and other vital supplies. Soviet far eastern settlements from the Bering Strait to the northern tip of Sakhalin—notably Okhotsk and Magadan—are also dependent upon the merchant marine. In these areas it has no serious competitors; its chief business, in terms of volume of freight carried, however, is to be found in the Black and Caspian Seas where the oil ports of Baku, Astrakhan, Makhachkala, and Batumi handle a large proportion of freight.

Between them road transport and airways deal with 4.1 percent of all freight traffic, although again this small percentage may disguise the peculiar importance of each. By Western standards, a road system exists only in European Russia; elsewhere the system is still primitive. Of a total of 812,880 miles of roads existing in 1938, only 52,500 miles were hard-surface. The rest were either "graded-dirt" roads—198,540 miles—or "natural-dirt"—561,840 miles. During many months of the year, vehicular traffic cannot use these roads because of rain or snow. By no stretch of the imagination can the entire network be regarded as adequate for a country of the size and importance of the Soviet Union. The chief role of the roads is for short-haul work, and in terms of *weight* of freight originated, they bear at least twice the load borne by the railways.

The civil airlines also occupy a place of importance in the entire transportation system. At present they are probably carrying as much freight as Soviet road transport in terms of *volume* of freight carried. Exact figures are not available. Broadly speaking, the air routes radiate from Moscow and follow the trunk railway lines fairly closely, although east of the Urals north of the 56 degree line of latitude, in an area more than twice as large as all of European Russia, they provide, most of the year, the only really efficient means of transport. Towns and settlements along the northern coast are already being served from Leningrad, while in the Caucasus and Central Asia, civil aviation supplements an as yet thinly developed surface transportation system. Toward the end of 1954, the total length of route operated had reached the figure

planned for 1950, that is, 105,000 miles.

The chief hopes of the new administration rest on the railways. Broadly speaking, much heavier freight trains—up to 4,000 tons—are envisaged, running at higher average speeds on better track. Last May, Kaganovich indicated that the administration based its plans for the railways on the assumption that they would be handling "not less than 50 to 60 percent" more freight by 1960. Electric and diesel traction is clearly regarded as being part answer to the problem of the heavier train. Of the 6,000 new locomotives required by 1960, 4,000 are to be either diesel or electrically driven. Much heavier steam locomotives are also to be developed, including an improved "L" type with booster and a new 2-8-0 and 0-8-4 "coupled engine." These additions will keep the average age of the Soviet locomotive pool down to the lowest in the world—in 1953, 82 percent of all railway work was being done by engines less than 18 years old. Production of freight cars is being increased, although the position is probably already satisfactory, given efficient operating conditions. Main track is to be given a good bed, and much double tracking of main routes is to be carried out. Electrification, which has been progressing at a snail's pace since 1946, is to be hurried forward so that by 1960, 11,400 miles of electrified lines—or about 10 times the 1940 mileage —may be in use.

At the same time, the capacity of the network is to be improved and new and important links established with China. By the Soviet-Chinese declaration of last October, the line now being built from Lanchow to Yunmin is to be extended northwestward to Urumchi and then westward to join the Turksib line at Alma-Ata. Another line will connect Peking via Paotow on the Yellow River with Ulan Bator, capital of the Mongolian People's Republic and Ulan Ude, the great Soviet industrial center east of Lake Baykal. The completion of both these projects—the Ulan Bator line should be open by next year—cannot fail to have far-reaching political, economic, and strategic effects in a vast region hitherto completely railless. Within the Soviet Union the exit points of the Urals' lines are to be improved, especially those leading to the Volga valley. The carrying capacity of the Turksib will be increased, as well as that of the Donbas-Krivoi Rog-Dnepr route, vital to the economic well-being of the Ukraine.

Plans for the inland waterways, many of them now being carried out, are no less interesting. To judge from the new administration's list of objectives, there appears to have been a distinct shift of interest since Stalin died. It is now quite certain that the ambitious scheme for joining the Amu Darya River and Aral Sea to the Caspian by a canal has been abandoned in favor of a more modest scheme 300 miles farther south which will bring water from Kerki on the Amu Darya to Tedzhen on the river of that name, and later to Ashkabad and beyond. This canal will not only permit navigation, but also improve, among other things, operating conditions on the Trans-Caspian railway. Of far greater importance to transport are the developments on the Siberian rivers, Angara, Irtysh, and Ob. Little is known of the Angara scheme, except that it is part of a long-term plan for regulating and utilizing the waters of that river, and that it has been started. The hydroelectric stations now under construction on the upper Irtysh, at Ust-Bukhtarma and on the upper Ob, at Novosibirsk, will add two further inland seas to the map of the Soviet Union, the Ust-Bukhtarma dam creating behind it a lake almost the size of Baykal. In the west, an extensive scheme for the regulation of the Volga's waters and those of its tributaries includes the construction of four dams on the Volga itself, three

on the Kama, and one on the Ufrinka, near Ufa, the net result of which will be to provide over 960 miles of deep waterways to shipping, none less than 12 miles wide. New and faster ships, including special tankers, are being built for these and other inland waterways.

Complaints, nevertheless, continue to be heard about the poor utilization of the water routes. Kaganovich himself pointed out how the nonmetals like timber, coal, grain, and consumer goods—all ideal shipping freight—were still being "conveyed long distances by railways running parallel to waterways." Many routes were either not used at all or only partially used. The amount of many types of consumer goods carried still had not reached prewar levels by April 1954. For this, Kaganovich roundly blamed the watermen themselves. They did not try to increase the amount of freight carried; what they carried they treated "in a dilatory fashion" or "carelessly"; nor did they utilize available shipping space properly. Kaganovich showed how the carriage of cotton by water had actually dropped, although the volume of cotton transportation had increased; there had to be an immediate increase in this freight on the Caspian Sea and Volga routes.

Very little information exists on trends in coastal shipping, motor transport, and civil airlines. It is evident, however, that a considerable amount of research is being done in the Central Arctic in connection with the movement of cyclones and related ice drifts; this would seem to indicate a deepening Soviet interest in the possibilities of the northern sea route, and it may well be that it is here that some surprising developments may occur in the next 6 years or so. So far as motor transport goes, there is good reason to believe that this is "increasing rapidly"—to borrow Kaganovich's own words. The range of vans and large and small trucks now being built in the Soviet Union is vast, but the utilization of motor transport generally is poor. The large cities will probably adopt centralized freight delivery services after the example of Moscow, but long-distance services, except between some of the larger west Soviet cities, seems most unlikely. The construction of paved roads is bound to go forward slowly. The expansion of the civil airlines in terms of route-mileage may well be slow also, although there are many signs that services on existing routes are being improved and intensified.

Conclusion

In conclusion, what are the outstanding features of this fast developing transport system? The first, obviously, is the absolute predominance of the rail network. Its importance has been most aptly compared to that of our own mercantile marine; certainly without its functioning properly "no normal metabolism would be possible in the Soviet Socialist society," according to Kaganovich. Yet, despite this, investment in this network, although adequate, is not generous. From this we may conclude that, even assuming that all the planned improvements of the railways are carried out by 1960, the network will not be able to do more than keep pace with industrial and agricultural expansion. It seems most unlikely, until 1970 at least, that the policy of building up self-sufficient economic regions—the aim of the Soviet leaders since 1939—can do much to ease the strain under which the system operates and, for many years to come, we may expect the system to remain peculiarly sensitive to the treatment it receives from within, or from without, the Soviet Union.

A second feature of the transport system is its growing complexity and the increasing dependence of its branches upon one another, and upon other sectors of the economy. The planned electrification of many of the trunk rail routes depends

to a large extent on the supply of cheap electricity from the hydroelectric stations now being built. The improvement of navigation on the inland waterways only becomes a possibility when the barrages of these stations are complete and lock systems installed. This, in turn, will permit the use of larger and faster ships and the movement of greater tonnages of bulky freight by water, notably in the Volga region. Where watersheds cannot be negotiated by canals and locks, and where railway construction is impracticable, the opening of new motor roads may be expected. It is interesting to note the Siberian rivers, Lena and Nizhnyaya Tunguska, separated by thick forest and mountains, were linked in this way recently.

A third and last feature may be distinguished in the increase in the number of strategic routes and in the changing character of some of the older ones since the end of World War II. The scale and rate of this particular type of change is, however, extremely difficult to assess, although its importance will be readily appreciated. This year, for instance, the excessive strain that has, in the past, been placed on the Trans-Siberian line has been eased by the opening of the south Siberian route as far as Abakan, while the comparative isolation of the light industries in the Tashkent area from good coal resources has been lessened by the completion of the Mointy-Chu link on a direct route to the Karaganda mines. With the construction in the near future of the Saratov (Volga)-Kungrad (Amu Darya) line, subtropical, southern Central Asia will be linked directly with the great industrial regions of the Soviet Union proper by four routes in place of the one in existence a quarter of a century ago. The complexion of a fifth route, the Trans-Caspian from Krasnovodsk, is changing gradually. Oil from Baku enters Central Asia by this route at present and textiles and subtropical goods leave by it, for transportation by water to Western Russia and the Urals. The development of the south Kara-Kum desert region will undoubtedly further enhance the usefulness of this line. Far to the east, an extension of the North Siberian line from Bratsk to the Lena River has been reported recently.

It will obviously be important for us to keep pace with changes like these. Our thinking about Soviet economic development generally tends to be at least 5, and often 10, years behind the times. Within a few years, for instance, with the completion of the two lines from China, our notions of the dependence of the Soviet's southernmost frontier regions upon a skeleton transport system will have to be radically revised. Again, the remarkable series of improvements to the great Volga waterway will have to be assessed and carefully related to the development of the powerful industrial region along the banks of the river's middle and lower reaches. The arrival by rail in the industrial Urals areas of increasing quantities of coking coal from Karaganda is already lessening the dependence of the Urals on supplies from the distant Kuzbas and may lead to the diversion of Kuzbas coal to the small but growing industrial regions of the Soviet far east. Efforts to harness the resources of the Soviet far north—by railway to Salekhard on the lower Ob, by air, and by sea—if successful, might well have important economic and far-reaching strategic effects. The problems facing Soviet transport have only to be stated in these terms for us to realize that rapid change will be a feature of the system for many years to come, but in this change we may be able to discover some pointers to the intentions, and the fears, of the present Soviet leadership.

BOOKS OF INTEREST TO THE MILITARY READER

THE FALL OF FRANCE JUNE 1940. By Major General Sir Edward L. Spears. 333 Pages. A. A. Wyn, Inc., New York. $5.00

BY COL GEORGE V. BRITTEN, *British Army*

Here is the sequel to *Prelude to Dunkirk*, and the second of a 2-volume work, "Assignment to Catastrophe." *The Fall of France* tells the story of June 1940 and is packed with characters, towered over by the heroic figure of Churchill.

The author was Churchill's personal representative to the French Government. M. Paul Reynaud, a man of "innate loyalty and pluck," was surrounded mainly by defeatists, to whom he eventually succumbed, despite Churchill's pleadings to fight on in "the Britanny Redoubt" and then, when it was too late for that, in North Africa. It was General Spears who, in accordance with a carefully laid plan, at the last moment took De Gaulle aboard his plane and flew him to England.

This volume makes sad reading, but fills in a number of gaps in our knowledge of the events of those grim days. It shows the extent of disintegration reached by the French Government, Army, and Air Force before the surrender by Pétain. The French Navy remained intact, but could not be induced to sail to British ports.

There are several intimate descriptions of Churchill: in some he is in France exhorting the French to fight on; in others, in England scraping the bottom of the barrel to find help for France; and in one, in his dressing gown, in France angrily demanding, in atrocious French, a bath.

NO. 13, BOB. By Jean Overton Fuller. 240 Pages. Little, Brown & Co., Boston. $3.50.

BY LT COL FRANCIS R. SULLIVAN, *CE*

The intriguing title of this book is the code name of a British intelligence agent parachuted into France during World War II. Although this story is based on a World War II situation, its discussion of prisoner of war co-operation with captors has timely significance in connection with similar problems of the Korean conflict. While the book primarily concerns itself with the experience of Captain John Starr—"No. 13, BOB"—it also contains an illuminating presentation of the extent and success of German efforts to counter British intelligence penetration of France.

The first part of the book is Captain Starr's own story—an exposition of the German counterespionage methods and revelations of an atrocious concentration camp system. In the second part, the author relates the method and the extent of her research to document Captain Starr's story. Her research substantiates Starr's veracity.

Although Starr was not initially subjected to the physical punishment and degradation typical of the "brain-washing" techniques practiced by Communists today, his story and those of prisoners of war held by the Communists during the Korean conflict have a similar ring. Either the indoctrination of armed forces on standards of conduct as a prisoner of war, or the standards themselves, or both, are inadequate and need revision.

OUTPOST BERLIN. By Peter K. Orton and Arno Scholz. 180 Pages. The British Book Centre, Inc., New York. $2.95.

BY MAJ FREDERICK A. SMITH, JR., *Inf*

Outpost Berlin is a pictorial report of the happenings that have taken place in Berlin since the end of World War II. The book contains only a brief descriptive text with the authors' photos.

Revealed in the pictures are signs of the two great struggles that have torn Berlin over the last decade. Truly stirring are the photos depicting the June uprising in 1953 of the people of East Berlin.

Many of the pictures have not been published before. This book should appeal primarily to those closely associated with life in postwar Germany.

TOKYO AND POINTS EAST. By Keyes Beech. 255 Pages. Doubleday & Co., Inc., New York. $3.75.

A SURVEY OF CLINICAL PRACTICE IN PSYCHOLOGY. Edited by Eli A. Rubinstein and Maurice Lorr. 363 Pages. International Universities Press, Inc., New York. $6.00.

BY CAPT WILLIAM R. PERL, *MSC*

This book is not concerned with the science of psychology, but is a survey of what psychology actually does. It describes the kind of research being conducted in present-day psychology and the various types of psychological testing and treatment offered throughout the country.

A large part of the volume is devoted to "government agencies with large-scale programs of clinical psychology," with a particularly informative article on the psychology program of the United States Army.

This book should be of interest not only to the psychologist or psychiatrist, but to almost anyone who wants to know what is going on in psychology and what it tries to accomplish.

THE PUSAN PERIMETER. U. S. Marine Operations in Korea. Volume 1. By Lynn Montross and Captain Nicholas A. Canzona, United States Marine Corps. 271 Pages. Superintendent of Documents, Government Printing Office, Washington 25, D. C. $2.00.

TWO YEARS IN THE ANTARCTIC. By E. W. Kevin Walton. 194 Pages. Philosophical Library, Inc., New York. $4.75.

BY CAPT THOMAS C. WYATT, *Inf*

This is an account of a polar expedition —a readable story of life in the Antarctic lived by members of a British survey party. The author describes the usual excitement which accompanies such a venture and accents the value of preparation. For example, the first year was devoted to training men and dogs and readying equipment.

Two Years in the Antarctic reveals that the mere routine of living under adverse conditions can actually be most dramatic. It is not difficult for the reader to find himself participating in phases of the expedition, which is a departure from many polar stories.

MEN AND PLANES. The Army Air Forces in World War II. Volume VI. Edited by W. F. Craven and J. L. Cate. 807 Pages. The University of Chicago Press, Ill. $8.50.

CURRENT TRENDS: PSYCHOLOGY IN THE WORLD EMERGENCY. By John C. Flanagan and others. 198 Pages. University of Pittsburg Press, Pittsburg, Pa. $4.00.

AMERICA'S WEAPONS OF PSYCHOLOGICAL WARFARE. Edited by Robert E. Summers. 206 Pages. The H. W. Wilson Co., New York. $1.75.

CULTURAL PATTERNS AND TECHNICAL CHANGE. Edited by Margaret Mead. 349 Pages. Columbia University Press, New York. $1.75.

JAPAN. From Surrender to Peace. By Baron E. J. Lewe Van Aduard. 351 Pages. Frederick A. Praeger, Inc., New York. $7.50.

BY LT COL RICHARD B. KREUTZER, *Arty*

Baron Van Aduard has written an interesting and scholarly narrative of the Occupation of Japan. The book develops the aims of the Occupation in a clear and concise manner. The early role of General Douglas A. MacArthur and his advisors is also covered in some detail. Of special interest is the author's analysis of the attitude of the Japanese people and their leaders toward the early days of the Occupation.

The book covers the major reformations, instituted by the occupation forces, and the progressive transition of the Japanese nation from the status of an enemy to that of a country anxious to assume its place among the free nations of the world. The discussion of the trials and tribulations of the move to assist Japan in regaining a peaceful posture is interwoven with a clear explanation of domestic and international political problems relating to such a program. The Soviet Union's role in the drama receives special treatment.

Baron Van Aduard's closing chapters conclude the successful attempts of the United States and her allies, and the role of Mr. John Foster Dulles, in obtaining a just treaty of peace for the Japanese. In addition, the author discusses the future of Japan, particularly in light of the permanence of occupation forces and the ever-changing international political situation.

This book furnishes general background information to those officers interested in Far Eastern problems and to those who might become involved in the higher level aspects of the security of Japan under current agreements.

FORBIDDEN LANDS. By Gordon Cooper. 165 Pages. Philosophical Library, Inc., New York. $4.75.

GRIERSON'S RAID. By D. Alexander Brown. 261 Pages. University of Illinois Press, Urbana. $4.00.

BY LT COL GREY DRESSER, *Armor*

Here is an exciting account, detailed and well documented, of Colonel Grierson —onetime music teacher turned cavalryman—who led a bold cavalry thrust from La Grange, Tennessee, deep into Confederate territory to divert attention from General Grant as he prepared to attack Vicksburg. That Grierson was successful in this most daring raid ever made by Union cavalry was not the result of his personal distrust of horses, or because his 6th and 7th Illinois Cavalry Regiments were, initially, unseasoned troops.

The story will be of particular interest to those few horse cavalry readers who remain, and is good fare for any student of the Civil War.

AMERICAN DEMAGOGUES. By Reinhard H. Luthin. 368 Pages. The Beacon Press, Boston. $5.00.

BY MAJ HERBERT D. CLARK, *AGC*

The book is comprised of 10 vignettes of persons who have achieved commanding roles in American politics including Huey Long, Joseph McCarthy, Theodore Bilbo, Vito Marcantonio, "Alfalfa Bill" Murray, James Curley, "Ma" and "Pa" Ferguson, "Gene" Talmadge, "Big Bill" Thompson, and Frank "I Am the Law" Hague. Although each individual is separately treated, the observant reader will notice certain basic similarities: "most have exploited race and religion, most have played up emotional appeal, and all have been talented exhibitionists."

Dr. Luthin's absorbing book is excellent reading for the casual reader and a must for the student of political science.

A RORSCHACH WORKBOOK. By Lucille H. Blum, Helen H. Davidson, and Nine D. Fieldsteel. 166 Pages. International Universities Press, Inc., New York. $2.00.

SPANISH & ENGLISH DICTIONARY. DICCIONARIO INGLES & ESPANOL. By Dr. Edwin B. Williams. 1,267 Pages. Henry Holt & Co., New York. Plain edge $7.50—Thumb indexed $8.50.

BY MAJ GILBERTO GONZÁLEZ-JULIÁ, *Inf*

This is a dictionary designed to close the wide gap existing in today's modern world concerning the lexicography which has evolved in the light of our constantly expanding era. A very modern work in the field of everyday expressions, simple and to the point, it gives the latest accurate conception of bilingual terminology—English-Spanish—as normally used by the majority of the English-Spanish speaking people of the world. The dictionary is a necessity for people who must use the modern terminology of both languages, and is presented in a manner never before expressed so comprehensively in a single volume. This is a must for Spanish speaking officers who are studying at United States military schools.

MILITARY LAW UNDER THE UNIFORM CODE OF MILITARY JUSTICE. By William B. Aycock and Seymour W. Wurfel. 430 Pages. The University of North Caroline Press. Chapel Hill, N. C. $7.50.

BY MAJ LINO BONUCCI, *QMC*

With the approval of the Uniform Code of Military Justice and the Manual for Courts-Martial in 1951, the Court of Military Appeals, composed of three civilian judges, was created. Since 1951, the Court has rendered over 500 opinions. The authors have considered all opinions of the Court from its inception through 13 August 1954.

This is an extremely well-written book with a comprehensive analysis of judicial interpretations to a great number of provisions in the Code and Manual. It is a splendid source of military case law—a ready reference for the military lawyer or for the civilian attorney retained in a military justice case.

KAGNEW. By Kimon Skordiles. 244 Pages. Radiopress, Tokyo, Japan. $2.75.

BY LT COL MITCHEL GOLDENTHAL, *CE*

This is the dynamic, vivid story of the Ethiopian battalions which fought in Korea from May 1951 until April 1954, engaging in 253 battles. Over 5,000 men of Emperor Haile Selassie's Imperial Bodyguard served during this period to assist the United Nations in overthrowing the Communist menace to the people of the Far East and to the rest of the free world.

The name "Kagnew," personally given to the battalion by the Emperor, applies two meanings to the freedom mission of the Ethiopian fighters in Korea: the first is "to bring order out of chaos," applicable to the restoration of order in Korea from the chaos created by the Communist attack: and the second meaning is "to overthrow," as applied to the Communist menace.

In this book, Ethiopia conclusively proves that she is capable of maintaining military strength for the service of international peace and security.

ELEMENTS OF RORSCHACH INTERPRETATION. By Robert M. Allen. 241 Pages. International Universities Press, Inc., New York. $4.00.

THE PEOPLES OF THE SOVIET FAR EAST. By Walter Kolarz. 193 Pages. Frederick A. Praeger, Inc., New York. $4.50.

BY IVAN J. BIRRER, *Ph. D.*

In this comprehensive treatise of a little known subject, the author describes Soviet colonization and Soviet colonial policy in the Soviet Far East. The reader meets strange sounding names: the Aborigines of the Soviet Far East, Yakuts, and the Tuvinians and their cousins. Of special interest is the author's conclusion that "the Soviet Union is behaving (toward their East colonies) as a European colonial power in the worst old-fashioned sense of that term."

MILITARY ORGANIZATION AND SOCIETY. By Stanislaw Andrzejewski. 195 Pages. Grove Press, New York. $4.50.

BY COL DANIEL C. POLLOCK, *USMC*

The aim of this treatise is the examination of relations between military organization and social structure. The method of inquiry is that of a comparative investigation of the connections between the two.

Great attention is paid to the history of other civilizations which is of interest to the military reader. The roots of aggression and struggle and the problem of basic power are discussed. Dr. Andrzejewski analyses such things as social stratification, distribution of wealth, size of political units and their cohesion, and the type, forms, and classification of military organization.

He shows how military organization influences social structure by determining the distribution of power or the ability to use violence. The most important drives toward war are shown to be those stemming from lust for power on the part of the leaders and from a desire for wealth on the part of the followers. The author concludes his book with an estimate of the current situation and an educated guess about the future.

The book contains philosophical bases and historical justification for some of our present-day practices of military organization. It is not a book quickly or easily read. The reader will find occasionally that the references tend to become obscure as the marked erudition of the book becomes increasingly evident. However, the trouble is worth the effort.

PRINCIPLES OF INSURANCE AND RELATED GOVERNMENT BENEFITS FOR SERVICE PERSONNEL. By Associates in the Social Sciences, United States Military Academy. 198 Pages. The Military Service Publishing Co., Harrisburg, Pa. $1.50.

THE MACMILLAN WORLD GAZETTER AND GEOGRAPHICAL DICTIONARY. Edited by T. C. Collocott and J. O. Thorne. 792 Pages. The Macmillan Co., New York. $6.95.

RUSSIA BY THE BACK DOOR. By Leon Maks. 264 Pages. Sheed & Ward, New York. $3.50.

BY MAJ THEODORE S. STAIGER, *Inf*

"What are the Russians really like?"

The author attempts to answer the question by telling a unique story of his entrusted mission in trying to find the head of the Polish underground movement, General Tokarzewski, who had been sent east from Poland during the mass deportations of 1939 by the Soviet Union.

His story relates his experiences during 13,000 miles of travel within the Soviet Union searching for the missing General. With a female companion, a good knowledge of the Russian language, and a small portable laboratory with which to fake passports, he takes the reader on a hazardous trip filled with facets of Russian customs and habits through forbidden zones into the very heartlands of the Soviet Union. The result is a readable but superficial account of what the Russians were like. In the foreword, the author admits that he presents himself as a player in the drama—not as a critic or spectator.

The reader, if he marvels at the naivety of Soviet officialdom as portrayed by the author, must keep in mind that the setting was 1939—while the Soviet Union was attempting to rebuild her military, security, and state organizational structures which were shaken to a state of inefficiency by the blood purges of the late thirties. The reader would not be objective if he discounted or overlooked this fact.

THE OBSERVER'S BOOK OF AIRCRAFT. By William Green and Gerald Pollinger. 287 Pages. Frederick Warne & Co., Inc., New York. $1.25.

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